STEEL

PRODUCTION • PROCESSING • DISTRIBUTION • USE

For forty-eight years—IRON TRADE REVIEW

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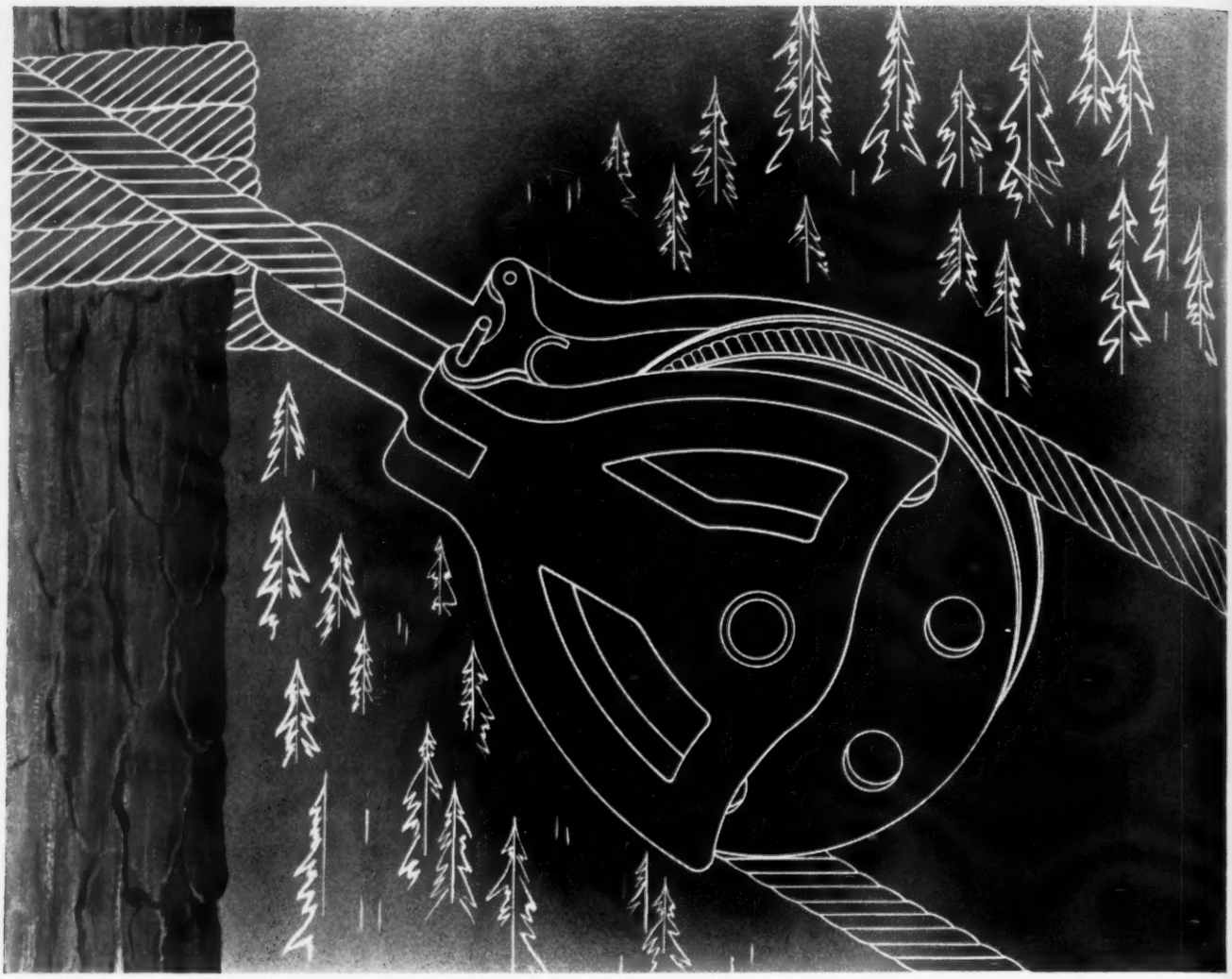

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As the Editor Views the News

THURSDAY was something of a festive day in the steel industry. In Tarentum, Pa., 25,000 people from nearby Allegheny valley towns turned out to pay honor to Harry E. Sheldon (p. 25), 75-year-old founder and president of the Allegheny Steel Co. This ceremony was impressive, and part of it went out over the airwaves to listeners in many parts of the country. In Cleveland executives of the steel industry attended the Great Lakes Exposition (p. 22) and while on the grounds three of the visitors delivered brief addresses over the radio. The American public heard much about the steel industry and its problems.

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Keeping "Man in Street" Posted

This is a phase of public relations in which some divisions of industry are woefully weak. Right now the public needs all the information it can absorb in order to discriminate between the good and bad advice offered by aspirants for public office. The more the people know about the problems of industry and of the fundamentals of economics, the better they will be able to discern the fallacies in the "something for nothing" doctrines that are being peddled so promiscuously by irresponsible demagogues. Time and money devoted to helping the man in the street understand industry and its problems is well spent.

• • •

Training Key Men Is Big Job

Two timely addresses dealing with improving the industrial personnel were delivered last week. At Harvard, Edward R. Stettinius Jr. (p. 24) urged that the search for executive material be conducted more scientifically and suggested that the appointment of an officer in charge of executive personnel would be desirable in many large corporations. At Youngstown, C. M. White of Republic Steel (p. 25) discussed the responsibility of foremen in connection with employer-employe relations. "Foremen who fail to realize that their job requires executive ability and a minimum of force and bullying," he declared, "are potent causes of strikes." This comes close to being one of the principal factors in the labor problem. More attention should be given to the selection and training of men in all key positions in industry. It is more than a happenstance that Messrs. Stettinius and White touch on similar subjects at the same time. The need of training is urgent.

• • •

Must Provide for Skilled Labor

Scraping of plane surfaces to true bearings is one of the older but lesser known metalworking processes. However, it is used widely today in the construction of machine tools (p. 42), both for bearing surfaces and for exposed surfaces where some form of decoration is desirable. Proper manipulation of scraping tools is a job for skilled artisans, for there is apparently as yet no successful mechanical method of doing this work. Here again is seen the problem of training men, to carry on in these skilled trades, and many industries are recognizing this need by setting up apprentice training programs to insure skilled help in years to come. Labor is indeed in the limelight these days.

• • •

Backbreaking Tasks Are Out

Mechanization still bears the brunt of attacks from those who are either too ignorant or too prejudiced to acknowledge how extensively mechanization *serves* labor and transfers from muscle to metal the backbreaking jobs in industry. Improvement and refinement of materials handling accessories (p. 50) in recent years, for instance, serves well to illustrate this point. . . . An interesting "backsaver" and timesaver for rail inspectors is a light two-wheel truck with a mirror attachment (p. 63) which is moved along a rail, revealing in the mirror any cracks, flaws or corrosion in the web or under side of the rail head. As simple as pushing a perambulator!

E. L. Shaner

Steel Executives Tour Expo; Predict Constant Progress

FORECASTS of continued improvement in the art of steelmaking, with resultant benefit to employes, stockholders and the public, were made by leading executives of the iron and steel industry Thursday night in Cleveland following a tour of the Great Lakes Exposition.

E. G. Grace, president, Bethlehem Steel Co.; W. A. Irvin, president, United States Steel Corp., and T. M. Girdler, president, Republic Steel Corp., made radio addresses from the showboat, S. S. MOSES CLEAVELAND.

Thursday morning Mr. Girdler entertained the directors of the American Iron and Steel institute at breakfast at the Union club and at golf and lunch at Pepper Pike Country club. Then the party toured the 150-acre exposition grounds and inspected the "Romance of Iron and Steel" exhibition which forms the central theme of the exposition. In the evening Mr. Girdler entertained at dinner at the Admiralty club.

Grace States Obligations

"The steel industry has three real obligations," said Mr. Grace, "to preserve fair treatment for labor; to deal fairly with the public; to exercise an intelligent trusteeship of the funds invested in the industry.

"The record shows how these obligations are being met. Rates of pay for labor are equal to or above the levels of our most prosperous periods. The development of good labor relations has kept pace with the great physical development of the industry. Labor and management have worked together to establish a firm foundation of collective co-operation. It is this relationship which has played so important a role in producing upon the American continent the highest standard of living known to man.

"The technological improvements of modern steel production have caused no major displacement of labor. Indeed, steel employment has multiplied many times in the last 50 years.

"Steel has met its obligations with the consuming public. Steel has always been ready to build the necessary facilities to meet the expanding needs of the country.

"We have not only our obligation to the working public and to the consuming public, but also to the investing public. The 552,000 investors in the steel industry have suffered patiently through the recent difficult years, and it is to be hoped that they may soon have an equitable return on their investments.

"Profits are essential to the continued progressive operation of any industry. A prosperous business is a great public benefaction. Profits when they are made accrue to society at large. They go to the wage earner and the investor who puts his money in the business and in the long run they benefit the consumer. Profits not only cause the industry in which they are made to thrive, but they also distribute wealth throughout all the related industries. Therefore, anything that jeopardizes the possibility of industry making reasonable profits is a direct blow to permanent prosperity."

Depression Effects Recounted

Mr. Irvin told how the steel industry met problems of the depression and of the spirit with which it faces the future.

"Among the first steps taken to combat the demoralizing influences of the depression was the adoption, by employes and management, of the 'share-the-work' plan," he said.

"As an illustration of the effectiveness of this program I would like to point out that the Corporation which I represent gave employment to an average of 75,000 more men than would have been required to perform the limited amount of work then available. Thus, in the five-year period ending Dec. 31, 1935, the number of employes given work averaged over 185,000 per month.

"The result of this plan was low individual earnings. Many men did not have sufficient work to provide for their needs. For all these workers we provided credit to an aggregate of more than $9,000,000 without any form of security.

"With the industry operating today at about 70 per cent of capacity on an 8-hour basis, 48,000 more men are engaged in steelmaking than there were in 1929 when the industry was operating on an 85 per cent basis.

"Thus it will be seen that the steel industry, in the face of an unprecedented decline in business, did maintain wage rates at 1929 levels until the point when current commercial and competitive conditions left no al-

(Left)—At the Great Lakes Exposition last Thursday, left to right, W. A. Irvin, president, United States Steel Corp.; Eugene G. Grace, president, Bethlehem Steel Co., and T. M. Girdler, president, Republic Steel Corp. (Below)—Mr. Irvin greeting four veteran steel workers whose combined records total 190 years. Left to right, Frank Utke, Charles N. Burns, Anton Walczak, Christie Leese and Mr. Irvin

ternative but to reduce them. These levels, however, were not reached until rigid economy plans had been put into effect, dividends reduced or passed entirely, and salary rates decreased. And the wage scale was, as stated, restored at the earliest practical moment."

Huge Investment Cited

Mr. Girdler pointed out that although the average price of steel was only 2 cents a pound, an investment of $50,000,000 was required to build a complete steel plant before a single pound of steel could be produced.

"Do you know that for each man employed in the industry, $11,500 must be invested by some one?" he asked. "That amount does not include wages. It takes that much money—$11,500—to make a job for a steel worker. When you realize that today over 500,000 persons are employed in this industry, you must immediately recognize that its reputed bigness is due to the natural character of the work it does.

"In order for the steel industry to meet the demands upon it today it must be prepared to turn out 500 different iron and steel products in as many as 100,000 combinations of shape, size, finish and chemical analysis.

"I believe that the American standards of living will continue to rise. I believe that we shall all live in better houses in which steel will play a larger part. I believe that our homes and factories and mills will be air-conditionsd and steel will play a large role in that.

"To meet all these needs and expanding requirements the steel industry is constantly developing new processes, new steels and improving the quality of the old ones. This year the industry is spending fully $9,000,000 on research for these purposes."

Guests at Mr. Girdler's dinner at the Admiralty Club included: Mr. Grace, Mr. Irvin, E. T. Weir, chairman, National Steel Corp.; W. W. Holloway, president, Wheeling Steel Corp.; B. F. Fairless, president, Carnegie-Illinois Steel Corp.; Charles R. Hook, president, American Rolling Mills Co.; W. J. Filbert, United States Steel Corp.; H. G. Dalton, chairman, Youngstown Sheet & Tube Co; E. L. Parker, president, Columbia Steel & Shafting Co.; C. D. Caldwell, president, Interlake Iron Corp.; F. J. Griffiths, president, Timken Steel & Tube Co.; L. F. Rains, president, A. M. Byers Co.; Frank R. Frost, president, Superior Steel Co.; S. E. Hackett, president, Jones & Laughlin Steel Corp.; E. J. Kulas, president, Otis Steel Co.; Henry A. Roemer, chairman, Sharon Steel Corp.; W. H. Davey, president, W. H. Davey Steel Co.; Walter S. Tower, executive secretary, American Iron and Steel institute; John W. Hill, Institute director of public relations.

Government Contract Rules Defined as Deadline Nears

WITH the Walsh-Healey government contract law becoming effective Sept. 28, Secretary of Labor Perkins last week issued regulations covering minimum wages "as determined by the secretary of labor," the 8-hour day and 40-hour week, working conditions and age limits of employes, exemptions and definitions.

Invitations for bids advertised from Sept. 28 on will contain the stipulations required by the act. Of particular interest to the steel industry are the definitions of the statutory exemptions, the meaning of the manufacturer or regular dealer clause, the overtime provisions and the definitions of the classes of employes affected.

Wage and hour records for each employe engaged on a government contract must be kept on file for at least one year after the termination of the contract.

Another set of regulations dealing with the procedure for hearing complaints on violations of the act will be published in the near future.

List Contract Stipulations

Condensed, contract stipulations include the following:

"The contractor is the manufacturer of or a regular dealer in the materials, supplies, articles, or equipment to be manufactured or used in the performance of the contract."

All persons employed by the contractor in the manufacture or furnishing of the materials used in the performance of the contract will be paid not less than the minimum wages as determined by the secretary of labor to be the prevailing minimum wages for persons employed on similar work or in the particular or similar industries or groups of industries currently operating in the locality in which the materials, supplies, articles, or equipment are to be manufactured or furnished under the contract.

No person employed by the contractor shall be permitted to work in excess of 8 hours in any one day or in excess of 40 hours in any one week, unless paid "such applicable overtime rate as has been set by the secretary of labor."

No male person under 16 and no female under 18 and no convict labor will be employed by the contractor.

No part of the contract will be performed under insanitary working conditions.

Any violation of the foregoing stipulations shall render the party responsible therefore liable to the government for liquidated damages, in addition to damages for any other breach of the contract, in the sum of $10 a day for each person knowingly employed in violation of the age limits "and a sum equal to the amount of any deductions, rebates, refunds or underpayment of wages due to any employe engaged in the performance of the contract, and in addition, the agency of the United States entering into the contract shall have the right to cancel same and make open-market purchases or enter into other contracts for the completion of the original contract, charging any additional cost to the original contractor."

The foregoing stipulations shall be deemed inoperative if the contract is for a definite amount not in excess of $10,000.

Statutory exemptions include instances where the contracting officer is authorized by statute or otherwise to purchase in the open market without advertising for proposals; where the contract relates to perishables or agricultural products processed for first sale by the original producers, or where the contract is with a common carrier where published tariff rates are in effect.

Brief of Regulations

Administrative regulations in brief, include the following:

"A manufacturer is a person who owns, operates or maintains a factory or establishment that produces on the premises the materials, supplies, articles or equipment required under the contract and of the general character described by the specifications. A regular dealer is a person who owns, operates or maintains a store, warehouse, or other establishment in which the materials, supplies, articles or equipment of the general character described by the specifications and required under the contract are bought, kept in stock and sold to the public in the usual course of business. Except as hereinafter provided, every bid received from any bidder who does not fall within one of the foregoing categories shall be rejected by the contracting officer."

"Whenever justice and the public interest will be served, bids for a contract or class of contracts will be exempted from the foregoing requirement by the secretary of labor upon the request of the head of the contracting agency or department when accompanied by his finding of fact that it will be so difficult to obtain

satisfactory bids for the contract or class of contracts under the stipulated restrictions, that the conduct of government business will be seriously impaired."

Rate of pay for overtime shall be one and one-half times the basic hourly rate or piece rate.

Records of employment shall be available for inspection.

Requests for exemption of a stipulation respecting minimum rates of pay and maximum hours contained in an existing contract must be made jointly by the head of the contracting agency and the contractor. All requests for exceptions and exemptions shall be transmitted through the procurement division of the treasury for submission to the department of labor.

Determinations of prevailing minimum wages or changes therein will be published in the federal register and sent to contracting officers.

"Nothing in these regulations shall be construed as impairing the authority possessed by any contracting agency to require labor standards in contracts not covered by this act."

Warns Against Deferring Price Revisions Under New Patman Law

CAN industries which are perplexed by the confusing new Robinson-Patman price law be safe in delaying trade practice revisions until after the federal trade commission and courts give clarifying decisions?

Because of the lack of rulings, this question has come to the front recently in the speculation created by the complex law. A New York attorney pointed out last week that sellers may be laying themselves open to future lawsuits if they assume they can safely defer price revisions until after interpretations have been made.

Gilbert H. Montague, the New York lawyer, asserted that "years hence, as fast as any expanding interpretation of the disputed provisions of the Robinson-Patman act appear in any of the decisions of the federal trade commission and the courts, purchasers who have been discriminated against may let loose a flood of claims and suits against sellers who now thoughtlessly assume that they can safely defer all efforts to bring their prices and their service payments into conformity with the act until after the commission and courts have interpreted the disputed provisions, and may recover threefold the total of the 'discrimination.' "

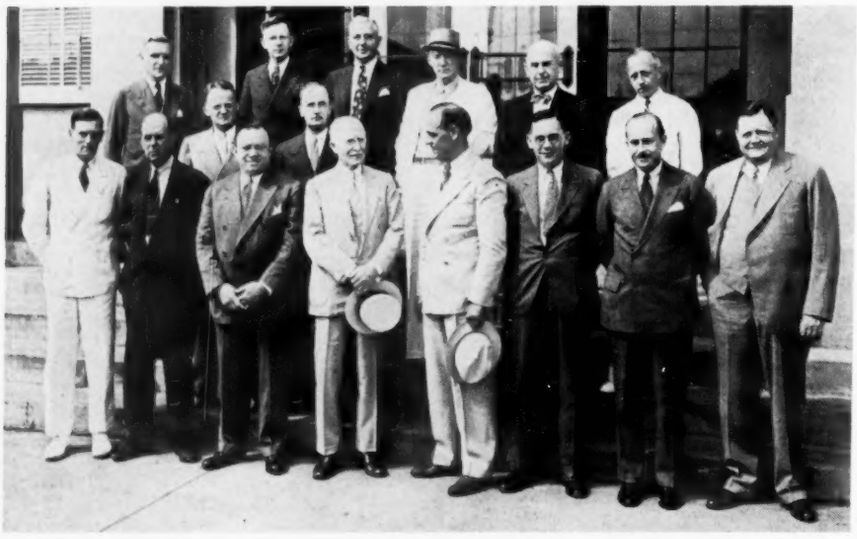
Cites Perils Involved

Mr. Montague told the Plumbing and Heating Wholesalers of New England Inc., meeting at Newcastle, N. H., that section 4 of the Clayton act, which now applies to the new section 2 of the Clayton act as enlarged by the Robinson-Patman act, provides that any one "injured in his business or property" by reason of anything forbidden in the anti-trust laws, may sue and recover "threefold the damages by him sustained, and the cost of the suit, including a reasonable attorney's fee." This is one of the chief perils to business men, he asserted.

No clarification has been made toward settling the wide difference of opinion among steel corporation attorneys on probable effects of the law. Some believe basing point systems are endangered if freight is considered one of the costs on which prices must be based. Others point to statements by senators and congressmen during the last session of congress that the measure had nothing to do with the basing point system.

So far, three branches of the iron and steel industry have made revisions which tend toward compliance with the Robinson-Patman law, even if it was not the prime factor responsible for the changes. These included an adjustment of southern pig iron prices; temporary downward adjustment of certain wire products and revision of a few clauses in some tin plate contracts. It is certain that other factors entered into some of the changes.

Group Witnesses Exhibition of Progress



REPRESENTING research, production, sales and management, these men met in Dayton, O., last Tuesday to witness the General Motors "Parade of Progress" which is on tour. First row, left to right: W. S. Whittaker, president, Inland Mfg. Co.; J. H. Davis, president, Moraine Products Co.; E. G. Biechler, president, Frigidaire Corp.; George M. Verity, chairman of the board, American Rolling Mill Co.; J. M. Jerpe, director of "Parade of Progress;" F. H. Prescott, president, Delco Products Corp.; C. W. Verity, vice president, Armco; W. F. Armstrong, vice president, Frigidaire. Second row: H. M. Richards, assistant general manager of Armco sales; W. W. Sebald, vice president, Armco. Back row: C. H. Murray, Hugh Wright, F. B. Dechant, J. B. Tytus, Dr. Anson Hayes, all of Armco; Joseph Deve, superintendent of "Parade of Progress"

Advances Plan To Train Executives

THE appointment of an officer in charge of executive personnel would be valuable in the selection and development of executives in American industry, said Edward R. Stettinius Jr., chairman of the finance committee, United States Steel Corp., in an address at the Harvard tercentenary celebration Sept. 17 at Cambridge, Mass.

"It must be admitted that the search for executives is only rarely what in any sense could be termed scientific," said Mr. Stettinius. "Granting that it is difficult to eval-

uate human beings with exactness, isn't it strange that while large organizations maintain precise inventories of physical properties and materials, men—principally executives and leaders—infrequently enter into the formal equation."

The responsibilities and duties of an officer in charge of executive personnel, Mr. Stettinius said, would include: Maintaining a complete, progressive record of all employes, actually or potentially eligible for rating as executives; maintaining organization charts on which would be registered all eligible executives; developing lines of promotion whereby opportunities for advancement would be company-wide; preparing and maintaining job specifications for all positions and seeing that qualified understudies are in training.

In addition, the officer would make available information concerning courses of study, books, periodicals and other activities of an educational nature; evaluate each position through job analysis; serve as secretary of a salary committee composed of executives, and act as fact-finder and adviser to the president and other principal executives in all matters pertaining to executive employment."

White Tells Foremen Their Position Requires Diplomacy

Foremen who fail to realize that their job requires executive ability and a minimum of force and bullying are potent causes of strikes, dissension and dissatisfaction, asserted C. M. White, vice president in charge of operations, Republic Steel Corp., in an address Sept. 19 before the thirteenth annual convention of the National Association of Foremen, Youngstown, O.

The foreman should have a mind flexible enough to appreciate the advantages of new processes, said Mr. White, and he must be a leader, a diplomat, ambitious and sympathetic.

"Frankly, I think that the foreman who fights the employe representation plan is afraid of his job," continued Mr. White. "He is afraid that he isn't good enough to hold it unless he can be an autocrat, the last word in his department.

"One of the main reasons that questions are settled more readily under the employe representation plan is that neither side regards the other as an enemy to be defeated at any costs. Employer and employe are no more enemies than are customer and salesman.

"Let me call one thing to your attention. In the steel industry 126 out of 176 major executives came up from the ranks. Only 13 entered the industry in an executive capacity. You men are already on the ladder which leads to the top. It depends on you how high you climb."

Four Steel Communities Honor H. E. Sheldon as "Good Neighbor"

HARRY E. SHELDON, founder and president of the Allegheny Steel Co., Brackenridge, Pa., and good neighbor of the upper Allegheny valley, was honored Thursday when citizens of Brackenridge, Tarentum, Natrona Heights, and Harrison township, of which the Allegheny company is the leading industrial interest, declared a holiday.

Acclaimed as the man who introduced stainless steel to America, who is not a show-window philanthropist, who places human dignity on a higher plane than dividends, the 75-year-old head of the Allegheny company was feted at a luncheon, and honored by a parade of school children, company employes, volunteer firemen, and ex-service organizations of the district. Of the 32,000 residents, those who did not participate in the parade or the community program afterward were interested spectators.

Many Presentations Made

A 30-minute broadcast over a national hookup featured John B. Kennedy and Lowell Thomas, news commentators. Numerous cups, honorary memberships, and other tokens of appreciation were presented to Mr. Sheldon, who, orphaned at an early age, began life at 14 as a machine shop apprentice, at 19 entered a sheet mill, and in 1901, when only 40 years old, helped to organize the predecessor to the Allegheny Steel Co., of which he was manager until 1908 and has been president since.

Commenting on the proceedings, Mr. Sheldon said:

"This holiday and celebration is, to me, not so much a personal testimonial as an assurance that the close, friendly co-operation between us will continue. It is evidence that we have a fine community, good citizens and an industry which has tried for over thirty years to play well its part in the community life.

"The efforts of everyone who has been connected with our company in that time, in mill, laboratory or office, have been devoted to building an institution which is greater and more enduring than any of those who have participated in its making. I regard it as a monument to all who ever contributed the labor of their heads or hands to its advancement.

"I hope and believe that this community, its citizens and its industry will continue in the future as in the past to solve their mutual problems together, whether it be the problem of increasing our usefulness, of caring for our needy and suffering or of resisting the ravages of a world depression or a spring flood.

"This spirit of co-operation will harm none and benefit all, from the Federal government which receives our tax payments to the children in our local schools."

Principal speaker on the radio program, Mr. Kennedy stressed the coordinate importance of industry and the community. The word "community," he pointed out, springs from the same root word as communism, but the community in a free democracy represents the middle ground between communism at the extreme left and fascism at the extreme right.

"The final answer to communism rests in communities such as these fostered here by Harry Sheldon," declared Mr. Kennedy.

FOUR steel communities suspended business activities to honor Harry E. Sheldon (right), president of Allegheny Steel Co. last Thursday. Here he is shown being presented a trophy by Dr. A. F. Walker as one feature of the all-day celebration

Employe Representatives Outline Problems in Series of Conferences

THIRTY-SIX employe representatives from the United States Steel Corp. subsidiary's 12 sheet and tin mills until recently operated by American Sheet & Tin Plate Co. concluded a three-day conference at Pittsburgh on Sept. 16, pursuant to their usual custom of such an annual convention. The meeting, which will be the last of the former American Sheet & Tin Plate Co., had as one of its purposes the desire to fuse the employe representatives' procedures with those of the Carnegie-Illinois Steel Corp.

The 36 employe representatives who held frequent executive sessions during the three-day convention interspersed their meetings by conferences with mill superintendents of Carnegie-Illinois Steel Corp. Upon conclusion of the convention a banquet was held in the Fort Pitt hotel, Pittsburgh, Sept. 16, to which various Carnegie-Illinois Steel Corp. operating officials were invited.

Meanwhile, strictly in conformity with the tenor of B. F. Fairless' Sept. 12 letter to employe representatives stating that a wage increase in the steel industry was impossible at this time but that the door was not closed to future negotiations, a special wage committee said to represent several thousand employes of the Carnegie Homestead works, Pittsburgh, conducted a conference at Pittsburgh, Sept. 16, with the Carnegie-Illinois Steel Corp. management. Their agitation centers not so much about a 10 per cent flat increase in steel wages, but an increase of $1.12 a day to bring the minimum rate of wages to $5 a day.

Shareholders Forced To Wait

Mr. Fairless' letter pointed out that for the first time since 1931, the entire Corporation had earned a net profit in the first six months of this year of $16,238,727, but that preferred stockholders had received only 50 cents a share quarterly during the last three years instead of the $1.75 to which they are entitled.

"Do you realize," he asked, "that when a wage increase of 10 per cent may be considered, on the basis of the Corporation payroll for the last year it would mean $25,000,000 more paid out in wages? On the Carnegie-Illinois payroll alone, a 10 per cent wage increase would take almost all the profit that the United States Steel Corp. earned in the first six months of this year."

Mr. Fairless invited the employes to show the management, in the face of large depression losses, reduced or eliminated dividends and present business uncertainties, how any higher wages could be paid.

Other developments in the steel labor situation during the week included:

Announcement by the American Iron and Steel institute that even though July steel output was 13 per cent below the average monthly production in 1929, employment in the industry was more than 10 per cent higher than the 1929 wage level and the average wage was nearly 2 cents an hour higher than in 1929. With hourly earnings averaging 67.3 cents, 514,700 employes, including 467,100 in the wage earning classification, were on the payrolls during July.

Declaration that 75 per cent of the questions arising under employe representation plans in the steel industry in the first six months of 1936 were settled in favor of the employes. Only 18 per cent of the decisions favored management, while 7 per cent were compromised or withdrawn. The Institute's study showed that during the first half of this year wage questions predominated, being under discussion 2063 times. A total of 5136 questions were discussed by men and management. Twelve per cent of the questions related to improved safety conditions.

Statement that the share of each dollar received from the industry's products which goes to employes in the form of wages has increased by more than 50 per cent since the beginning of this century. For each dollar's worth of products sold last year the employes received 41 cents, while 35 years ago only 27 cents out of each dollar of sales went into payrolls.

An interesting sidelight on the labor situation in the Pittsburgh district came to light last week when an acute shortage of homes and business buildings became noticeable.

Mill Wages in Sharp Rise from 1933

AVERAGE weekly earnings rose 180 per cent in bar mills between March, 1933, and March, 1935; 170 per cent in rail mills; 162 per cent in plate mills; 138 per cent in sheet mills; 114 per cent in blooming mills; 57 per cent in tin plate mills and 36 per cent in puddling mills, according to recent studies by the bureau of labor statistics.

Twenty-one departments were covered, but for 11 of them no comparison with 1933 was available. As reported in STEEL, May 11, page 27, average weekly earnings in open-hearth furnaces showed a gain of 127 per cent over 1933; bessemer furnaces 88 per cent; blast furnaces 73 per cent.

In view of the fact that substantial increases took place in all departments where comparisons between the two years were possible, the bureau assumes that similar advances were made in the remaining 11.

While bar mill employes' average weekly earnings increased 180 per cent, their average hourly earnings gained 51 per cent and average weekly hours 85.3 per cent. Strip mill employes had the highest average weekly earnings in March, 1935, $28.66, but their average of weekly hours also was highest.

The accompanying table has been compiled by STEEL from the studies prepared by the bureau.

	Av. Weekly Earnings			Av. Hourly Earnings			Av. Weekly Hours		
	March	March	Per cent	March	March	Per cent	March	March	Per cent
Mill	1935	1933	Increase	1935	1933	Increase	1935	1933	Increase
Bar	$20.21	$7.22	180	64.2c	42.5c	51.0	31.5	17.0	85.3
Rail	22.88	8.47	170	66.8	52.2	28.0	34.3	16.3	110.0
Plate	18.04	6.88	162	62.3	44.9	38.8	29.0	15.3	89.5
Sheet	26.72	11.22	138	70.1	47.2	48.5	38.1	23.7	60.7
Open-Hearth	25.84	11.39	127	72.9	51.3	42.1	35.5	22.2	60.0
Blooming	23.69	11.09	114	66.6	48.8	36.5	35.5	22.7	56.0
Bessemer	20.26	10.79	88	65.8	49.1	34.0	30.8	22.0	40.0
Blast Furn.	22.06	12.77	73	58.7	44.5	31.9	37.6	28.7	31.0
Tin Plate	28.09	17.84	57	73.8	52.7	40.0	38.1	34.4	10.8
Puddling	19.62	14.46	36	61.9	47.4	30.6	31.7	30.5	3.9
Strip	28.66			71.5			40.1		
Electric Furnace	24.63			62.9			39.1		
Sheet-bar	23.93			66.1			36.2		
Rod	22.77			68.7			33.1		
Seamless Tube	22.14			55.9			39.6		
Wire	21.78			64.6			33.7		
Skelp	20.98			65.3			32.1		
Lapweld Tube	19.70			60.1			32.8		
Buttweld Tube	19.43			61.8			31.5		
Structural	19.30			59.3			32.5		
Billet	17.68			64.3			27.5		

Announce Process for Selective Surface Hardening of Crankshafts

CULMINATING several years of experimental work and actual production practice, Ohio Crankshaft Co., Cleveland, is announcing a new process for selective surface hardening of steel by electrical induction. Since electricity can be controlled accurately, the process is said to permit the surface heating and quenching of practically all ferrous materials of cylindrical section, with the resulting hardened surface kept within close limits as to area and depth.

The process has been tradenamed the Tocco process. The first application to be worked out and perfected for industrial use has been the hardening of crankshafts at the bearing surfaces. As internal combustion engines have been speeded up to increase horsepower without increasing size, harder bearing metals have become necessary and these have required harder crankshaft bearing surfaces to reduce wear.

Among advantages claimed for the new process in crankshaft manufacture are economy through elimination of high-cost alloy steels and reduction in machining time, superior hardened areas and longer-lived shafts.

Crankshafts to be hardened by the process are made from steel which in addition to passing the usual mill inspection tests is preferably of the fine-grained type. After forging, the crankshafts are heat treated or normalized to obtain the desired physical properties. However, the customary high brinell hardness to resist bearing wear is not needed. This permits increased ductility and greater ease in machining.

Crankshafts are machined, radial oil holes drilled and the journals rough ground to leave from 0.020-0.030-inch in diameter oversize for the final grind after surface hardening.

For the hardening operation, a high-frequency current at high voltage is transformed into low voltage with high amperage. This current passes into inductor blocks which surround but do not actually touch the bearing area it is desired to harden. The inductor block current includes a current in the surface of the metal and this induced current is the heating factor.

When the area to be heated has been subjected to an accurately controlled, high-frequency current for the correct length of time, the electrical circuit is opened and simultaneously the heated surface is quenched by a spray from a water jacket built into the inductor block.

After all the main and pin bearings are hardened, the shaft is drawn at a low temperature to remove strains. A final grind then completes the shaft.

The combination of a split-second heating cycle and instantaneous pressure quenching is said to produce a surface hardened zone blending gradually into the core with no sharp line of demarcation and consequently no opportunity for spalling. The bearing surfaces of finished shafts have a hardness of 60 Rockwell C.

Crankshafts made by the new process have already been adopted by plants of the International Harvester Co., Chicago; General Motors Corp., Detroit; Hercules Motors Corp., Canton, O.; Packard Motor Car Co., Detroit, White Motor Co., Cleveland; Waukesha Motor Co., Waukesha, Wis., and several others.

Ohio Crankshaft Co. will demonstrate the process at the National Metal exposition in Cleveland, Oct. 19-23, by actually hardening crankshafts.

Demand for Machine Tools Curtailed During August

Declines in both foreign and domestic orders for machine tools during August resulted in a 13 per cent recession from the July volume, according to the National Machine Tool Builders association, Cleveland.

From available reports, inquiries and

All-Steel Fishing Trawler on Trial Runs

TRIAL runs of the STORM, *first of three new all-steel fishing trawlers, are being made out of Boston Harbor. Hulls of the new vessels, which are* 144 *feet long, are of unusually heavy construction. The hold, shown at left, is made of nickel-clad steel supplied by International Nickel Co. Inc., and is equipped with refrigeration ducts permitting constant low temperature. Bath Iron Works, Bath, Me., built the ship for Bay State Fisheries. It is capable of a speed in excess of* 11 *knots*

prospects for the next few months continue to be favorable, the association said.

The index of orders, based on 1926 as 100, dropped to 127.5 during August, compared to 150.1 in July and 125.8 in August, 1935. The three months' trend continued upward at 135.5 against 132.6 for the previous month. The average index for the year to date is 122.4, with foreign orders averaging 18.1 per cent of the total.

Airplane Manufacturers, Consumers of Quality Steel, Show Production Gains

DOMESTIC airplane manufacturers, consumers of high quality, thin gage steel, produced 1363 planes in the first half of this year, compared to 851 in the same period last year, the department of commerce reported recently.

This increase of 60 per cent was attributed largely to the demand for light planes, construction of which was almost doubled.

According to Leighton W. Rogers, president, Aeronautical Chamber of Commerce, sales during the first six months of 1936 increased 48 per cent over the same period last year but the aggregate value fell about 6 per cent because of fewer sales of higher priced transport planes.

"Commercial aircraft engine deliveries during the first half increased from 903 in 1935 to 1239 this year, or 41 per cent," said Mr. Rogers. "The sales value increased from $3,130,000 to $4,212,000, or 35 per cent. Commercial and miscellaneous spare part sales increased from $2,601,000 to $3,218,000.

Steel tonnage requirements of the industry still are small, but the value of the material is comparatively high. Estimates of the average amount of steel per plane vary widely. The use of stainless steel in thin gages began in 1928. However, total tonnage is boosted considerably through hangar and plant construction and the requirements for tools.

Shot welding is widely used in airplane assembling.

At present the industry includes 60 aircraft plants, including experimental shops; 20 engine plants, and about 180 plants producing instruments and other accessories. Some 225 other plants supply materials and machinery.

All-Metal Pursuit Plane

SALIENT features of this new all-metal pursuit ship include retractable landing gear, adjustable pitch propellor, wing flaps and cowl flaps. According to the army tests, the ship's performance equalled that of other models of greater power. A 14-cylinder engine developing 750 horsepower was used. Structure of the plane is entirely of aluminum alloy, with the exception of the tubular motor mounting and landing gear parts, which are of steel. Builder is the Chance Vought Aircraft division of United Aircraft Mfg. Corp., East Hartford, Conn.

Lists Nine Aids To Rail Service

PENNSYLVANIA railroad has recently released a special report detailing the improved technical processes, inventions and research it has been conducting toward improvement of freight and passenger service.

Nine outstanding projects recently completed or still underway are as follows:

1—Special electric locomotive tests at Claymont, Del., over a section of track equipped with delicate instruments to measure the pressures and stresses of locomotive wheels on the rails. These tests led to the selection of the types of locomotives used in the high-speed electrified passenger service in the eastern seaboard territory.

2—Development of the streamlined contours of the new electric and steam locomotives through wind tunnel tests, in which, for the first time, clay models capable of immediate alteration in shape were used.

3—Numerous forward steps in the electrification of the road between New York, Philadelphia, Baltimore and Washington, including improved circuit breakers, a non-corrodible wire system, better transmission circuits, elimination of high voltage circuit breakers from locomotives and a superior type of track circuit bond.

Strain on Axles Shown

4—Locomotive road tests over various sections of the system, using electrically-operated instruments which recorded on a photographic film the forces exerted at the axles and elsewhere on the locomotive at various speeds.

5—A series of bridge tests now under way near New Brunswick, N. J., Chester, Pa., and Elkton, Md., for the practical revision of certain theoretical formulae used in calculating the effects on bridges of train movements over them.

6—Extensive research in air-conditioning passenger cars, producing improved apparatus and a scientific scale of differentials between interior and exterior temperatures for maximum health and comfort.

7—The development of a new spring arrangement for freight cars to prevent excessive vertical movements of the car body and protect the contents from damage.

8—Development of a new 152-pound rail, the heaviest regularly used anywhere in the world. As a result of extensive research in design, it is only 17 pounds heavier than the rail formerly in use, but 80 per cent stronger.

9—The invention of a new rail joint in which the bars are curved or "waved" in such a manner as to reduce wear.

LaFollette Subcommittee Begins Hearings Sept. 22

The LaFollette civil liberties subcommittee will begin hearings in Washington on Sept. 22, according to announcement made last week.

It is expected that this set of hear-

ings will last more than a week. While the program has not yet been arranged, it is understood that during the course of these or future hearings the question of arming steel mills will be considered.

Meetings

FOR the second time within the last six weeks, exhibit space of the National Metal exposition is almost exhausted and additional space is required. This announcement was made last week by W. H. Eisenman, managing director of the Metal show which will be held in Public auditorium Cleveland, Oct. 19-23.

This means that the show management must expand its exhibit facilities immediately, in spite of the fact that 169,000 square feet, or nearly 4 acres, of floor space had been provided for exhibits. Space has been contracted for by 210 manufacturers of metals, metal products and metalworking equipment.

The American Society for Metals, American Institute of Mining and Metallurgical Engineers, American Society of Mechanical Engineers, American Welding society and Wire association, are co-operating in the comprehensive Metal congress program to be held in conjunction with the exposition.

70 EXHIBITORS IN PITTSBURGH PURCHASING AGENTS SHOW

Pittsburgh Association of Purchasing Agents is holding its second annual industrial exhibit in the William Penn hotel, Pittsburgh, Oct. 22-23. About 70 companies will be represented with exhibits.

I. E. Walton, Heppenstall Co., is general chairman of the exhibitors' committee. He is assisted by Albion Bindley, Pittsburgh Steel Co.; F. H. MacKnight, Westinghouse Airbrake Co.; R. D. King, Koppers Co.; Thomas D. Jolly, Aluminum Co. of America; Charles E. Briner, McKay Co.; W. E. Bittner, Diamond Alkali Co.; and Walter Brubach, Gulf Oil Corp.

A banquet will be served Oct. 23 for purchasing agents, exhibitors and others interested in the exhibit.

PUBLIC UTILITY IN DETROIT BUYS BLAST FURNACE GAS

A pipeline 48 inches in diameter and of welded construction will be built by the Great Lakes Steel Corp., Detroit, for conveying blast furnace gas from its stacks at Zug Island to the Delray plant of the Detroit Edison Co. Contracts for the construction of the line have been awarded to the Semet Solvay Engineering Corp., New York. The line will cross the River Rouge over a new bridge and will extend about 2400 feet to the Delray plant. The river crossing will be about 200 feet and will clear high water by 150 feet.

District Steel Rates

Percentage of Open-Hearth Ingot Capacity Engaged in Leading Districts

	Week ended Sept. 19	Change	Same week 1935	Same week 1934
Pittsburgh	72	None	46	16
Chicago	72½	None	59½	22
Eastern Pa.	48	+ ½	35½	17
Youngstown	80	+13	54	26
Wheeling	92	— 6	84	26
Cleveland	82	+ 2½	67	28
Buffalo	76	— 5	37	21
Birmingham	64	None	50	25
New England	70	None	68	28
Detroit	95	— 5	94	77
Cincinnati	76	None	†	†
Colorado	63	None	†	†
Average	72½	+ 3	52	22½

†Not reported.

Production

HEAVIER operating schedules at Youngstown, eastern Pennsylvania and Cleveland lifted the national steelmaking rate to 72½ per cent, a gain of 3 points. This compares with 52 and 22½ per cent, respectively, in the comparable weeks of 1935 and 1934. Other districts were steady, with the exception of slight declines at Wheeling, Buffalo and Detroit. Details follow:

Youngstown—Averaged 80 per cent last week, up 13 points, due to resumptions after the holiday. Youngstown Sheet & Tube Co. has started up its bessemer converter and lighted a fourth blast furnace at its Campbell works. A rise to 81 per cent is expected this week.

Cleveland—Up 2½ points last week to 82 per cent as National Tube Co. at Lorain resumed with one furnace to operate 12. Corrigan, McKinney division of Republic Steel Corp. continued with 12 out of 14 active, and Otis Steel Co. is operating at capacity.

Pittsburgh — Unchanged at 72 per cent, based on operations by the United States Steel Corp. subsidiaries at 68 per cent and the independents at an average of 75 per cent. Thirty-eight steelworks blast furnaces are now operating, a gain of one from a week ago as Jones & Laughlin Steel Corp. has blown in the last of its inactive stacks.

Central eastern seaboard — Ingot production is showing a slight upward trend, with output last week at 48 per cent, and a higher rate is regarded as likely for the current period.

Chicago — Held at 72½ per cent for the fourth consecutive week. While this is practically the limit of available steelmaking capacity, some additional open-hearth furnaces will be ready for operation next month.

Detroit — Off 5 points to 95 per cent, based on engagement of 18 out of 19 basic open-hearth furnaces. Within the next two weeks two basic open-hearth furnaces being built here by Great Lakes Steel Corp. probably will be completed and placed in operation.

Wheeling—Off 6 points to 92 per cent last week, with 34 out of 37 open-hearth furnaces active, compared with 36 on two weeks ago.

Birmingham—Steady at 64 per cent, with 14 open hearths in production. Tennessee Coal, Iron & Railroad Co. continues 10 open hearths in operation, while Gulf States Steel Co. has 4 out of 6 on.

New England—Unchanged at 70 per cent last week.

Cincinnati—Steelmaking held at 76 per cent, with 19 of 24 open hearths active. Little change is expected, with equipment in some cases staggered to enable repairs.

Buffalo—Off 5 points to 76 per cent last week, due to changeover of several units. A rebound to 81 per cent is expected this week.

Colorado—Remained at 63 per cent last week, with ten furnaces operating.

To Scrap Blast Furnaces; Rehabilitate Two More

American Steel & Wire Co. has given a contract to the Hetz Construction Co., Niles, O., for dismantling of one of the two blast furnaces at its Morgan Park (Duluth), Minn., plant formerly operated by the Minnesota Steel Co. The furnace to be torn down is No. 2, built in 1910-16 It had an annual capacity of 163,750 gross tons of basic iron.

As announced in STEEL for Sept. 7, the company is making preparations to place No. 1 furnace in blast, the lighting date probably to be within the next 60 days, or as soon as sufficient raw materials can be accumulated. This furnace was relined in 1931 and has an annual capacity of 163,750 tons. The blast furnace plant was last operated in 1930. It is understood that the by-product coke plant also will resume.

Demolition of the No. 2 stack will start immediately. The contract with the Hetz company provides additionally for tearing down five of the ten 75-ton open-hearth furnaces at Morgan Park, these five furnaces having previously been regarded as abandoned.

Hetz Construction Co. also recently received a contract for repair work at the plant of the Wickwire Spencer Steel Co., Tonawanda, N. Y. This work involves repairs to the two blast furnaces, Harriet X and Y, ore bridge and trestle. This plant has been inactive since 1930.

Men of Industry

WILLIAM C. STEVENSON, chief mechanical engineer since June, 1919, has been appointed chief engineer of Duquesne steelworks of Carnegie-Illinois Steel Corp. A graduate of Carnegie Institute of Technology, he began his career with Carnegie Steel Co. at the Isabella furnaces, Etna, Pa., July, 1908. In 1910 he was transferred to the Duquesne steelworks as draftsman and was promoted to chief draftsman Jan. 1, 1919.

Howard L. Bodwell, formerly with the engineering department of American Sheet & Tin Plate Co., has been appointed assistant chief engineer of the construction engineering division of Carnegie-Illinois. A graduate of Massachusetts Institute of Technology, class of 1898, his service with United States Steel Corp. subsidiaries has been continuous since 1901.

Howard K. Ihrig, formerly with the engineering department of American Sheet & Tin Plate Co., has also been appointed assistant chief engineer of the construction engineering division of Carnegie-Illinois.

Harry G. Cover, formerly with the roll and machine division, Canton, O., of the American Sheet & Tin Plate Co., has been appointed chief draftsman of the construction engineering division of Carnegie-Illinois, and Klaus Egge has been named assistant chief draftsman.

♦ ♦ ♦

William A. Rogers, former head of the Rogers-Brown Iron Co., Buffalo, sailed Sept. 12 from New York for an extended tour of the British Isles.

♦ ♦ ♦

M. D. Archangeli, since 1927 identified with the sales department of the Wilcox-Rich Corp., Detroit, has been made sales manager of the Saginaw division. He joined the firm in 1921.

♦ ♦ ♦

Leonard J. Buck Jr., president, Leonard J. Buck Inc., New York, importer of ores and pig iron, recently returned from a five weeks' trip abroad. He visited England, Germany, Sweden, Finland and Russia.

♦ ♦ ♦

E. E. Giessel, parts manager and special assistant to the president of the Four Wheel Drive Auto Co., Clintonville, Wis., since 1930, has been appointed manager of the parts, shipping and service departments of the company.

♦ ♦ ♦

J. H. Otis has been named parts and accessories manager of the Pontiac Motor Co., Pontiac, Mich., succeeding O. A. Lamoreaux, who has been granted a leave of absence because of ill health.

♦ ♦ ♦

Calvin Verity, executive vice president, American Rolling Mill Co., Middletown, O., has been elected to the board of directors of the Rustless Iron & Steel Corp., Baltimore, to fill the vacancy created by the death of George M. Seaman.

♦ ♦ ♦

William P. Yant has been elected director of research of the Mine Safety Appliances Co., Pittsburgh, manufacturer of safety equipment. He formerly was chief chemist in the health division of the United States bureau of mines.

♦ ♦ ♦

Ralph Fisher, formerly associated with the Houdaille-Hershey Corp., has been named sales manager of the stamping (Eaton Detroit Metal Co.) and bumper divisions of Eaton Mfg. Co., with headquarters at 9771 French road, Detroit.

♦ ♦ ♦

C. E. Noble has been appointed sales engineer, Pyrometer Service & Supply Corp., Cleveland. Mr. Noble formerly was connected with the E. C. Atkins Co., Indianapolis, serving 10 years as assistant metallurgist and more recently in the sales organization.

♦ ♦ ♦

Herbert A. May has resigned as vice president of the Safety Car Heating & Lighting Co. to become vice president of the Union Switch & Signal Co., with headquarters in Pittsburgh. He will continue as a director of the Safety Car Heating & Lighting Co.

♦ ♦ ♦

C. F. Cruciger, vice president in charge of sales, Spang, Chalfant & Co. Inc., Pittsburgh, has been granted a leave of absence until Jan. 1. Mr. Cruciger is a veteran employe of the company and had been identified with the former Spang Co., Etna, Pa.

♦ ♦ ♦

E. M. Prior has been appointed to represent the Rotary Electric Steel Co. (Michigan), Detroit, in Chicago and western territory. He will be located at 205 West Wacker drive, after Oct. 1. Mr. Prior has been in Chicago for a number of years, representing the Pressed Steel Co., Wilkes-Barre, Pa.

♦ ♦ ♦

William F. Wise has been elected president of Republic Products Corp., 441 York street, Detroit. Mr. Wise for the past nine years has been general sales manager of Ex-Cell-O Aircraft & Tool Corp., Detroit.

R. B. Criddle has been appointed secretary-treasurer of the Republic corporation. He formerly had been sales manager of the machinery division of Ex-Cell-O Aircraft & Tool Corp.

♦ ♦ ♦

Franklin P. Waller, for the past 12 years managing director of the Compagnie des Machines Harnischfeger, European subsidiary of the Harnischfeger Corp., Milwaukee, has returned to the general offices. He will shortly assume new duties as the company's special representative in the eastern part of the United States, with offices in New York.

♦ ♦ ♦

A. C. Goodnow, formerly president of the Standard Silica Co., Chicago, has joined the White Rock Silica Co., Chicago, as vice president. Mr. Goodnow, who was associated with the Standard company for 12 years, will be identified with the production and sales departments of the White Rock company.

♦ ♦ ♦

E. J. Bognar, identified with Corundite Refractories Inc., Massillon, O., for over nine years and who for the past three and one half years served that company in the capacity of co-receiver and manager, has been made vice president in charge of super refractories of the Union Mining Co., Pittsburgh. He has also been placed in charge of research.

♦ ♦ ♦

Frederick O. Schramm has been appointed sales agent in the New York metropolitan district and vicinity for Fort Pitt Spring Co., McKees Rocks, Pa. Mr. Schramm's offices are at 11 West Forty-second street. As announced in STEEL, Sept. 14, page 29, he has also been named district sales agent by Pittsburgh Steel Foundry Co., Glassport, Pa.

♦ ♦ ♦

Sir Newton Moore, president, Dominion Steel & Coal Corp., Montreal, Que., has resigned because of ill health. Arthur Cross, formerly a director and vice president, will succeed Sir Newton. Mr. Cross joined the company in 1931 as assistant to the president and treasurer.

H. J. Kelley, of Sydney, N. S., has been elected first vice president of Dominion Steel & Coal. He was appointed general manager of plant operations in 1924 and will continue in that post.

♦ ♦ ♦

David S. Pyle, after 44 years' service in the manufacture of tin plate, has resigned as general superintendent of the Shenango and New Castle plants of the Carnegie-Illinois Steel Corp., effective Oct. 1.

In 1892 he entered the employ of the New Castle Steel & Tin Plate Co. Inc., of which George Greer was president. This company sold out to the American Tin Plate Co. in 1900 and eventually the works passed to the American Sheet & Tin Plate Co., and finally to Carnegie-Illinois. In 1905 he was named manager of the Shenango works and four years ago became general superintendent of the two plants at New Castle.

Early in the year he sustained in-

jury to one foot which prevented him from attending to his duties. He presented his resignation in May, but the corporation refused to accept it and when again presented a short time ago, it was accepted with regret.

♦ ♦ ♦

A. E. Zimmerman, who has been active in the sheet metal business for the past 15 years, has been appointed superintendent of the Par-Brook Mfg. Co., sheet metal products, Cleveland.

H. L. Dalzell, associated with the company for the past year, has been promoted to sales manager. His previous experience has been with Youngstown Sheet & Tube Co. and Dalzell Bros. Co., Youngstown, O.

William Sasak, who has been in the engineering department for the past two years, has been promoted to chief engineer. He formerly had been connected with the Van Dorn Iron Works, Canton Art Metal Co., Jamestown Metal Equipment Co. and American Coach & Body Co.

♦ ♦ ♦

William F. Henning has been appointed domestic sales manager of the American Screw Co., Providence, R. I. Mr. Henning has been assistant manager of this department for 15 years and succeeds to the post vacated by the death of Albert B. Peck.

Walter Bromley, formerly sales representative in the central states and the New England district, has been made assistant domestic sales manager.

Vincent Roddy, formerly director of the planning and research division, has been appointed assistant to the general manager, Eugene E. Clark. Harry Mayoh will continue as sales promotion manager, the position to which he was recently appointed.

♦ ♦ ♦

Robert W. Frank has been appointed assistant chief metallurgist of the Duquesne works of Carnegie-Illinois Steel Corp., succeeding Wilbert A. Saylor, who has been transferred to the metallurgical department of the Ohio works of the company at Youngstown, O. Mr. Frank previous to his identification with the Duquesne works in 1933, had been with Jones & Laughlin Steel Corp. since 1921.

Died:

JAMES LIPPINCOTT, 70, chairman of the board of the West Leechburg Steel Co., which recently merged with the Allegheny Steel Co., in Pittsburgh, Sept. 14. Mr. Lippincott was associated with the iron and steel industry for more than half a century. In 1885 he entered the employ of Carnegie Bros. & Co. Ltd., Pittsburgh, and three years later was attached to the executive department of the company. Soon after he left to join Kirkpatrick & Co.

James Lippincott

Ltd., Pittsburgh. In 1897, with associates, Mr. Lippincott founded the West Leechburg Steel Co., retaining his affiliation with Kirkpatrick & Co., and when the latter firm was sold to American Sheet Steel Co. in 1900, Mr. Lippincott was identified with the operating and sales departments of the American company until 1906. He served as secretary of the West Leechburg company until 1908 when he was appointed vice president and general manager. In 1913 he was named president and in April, 1935, succeeded to the chairmanship.

♦ ♦ ♦

James Strachan Milne, 70, marine consulting engineer, New York, at his home in Brooklyn, Sept. 7.

♦ ♦ ♦

Evan Jones, 54, an assistant superintendent for Carnegie-Illinois Steel Corp., in Houston, Tex., Sept. 8.

Edwin R. Crawford

♦ ♦ ♦

John Hull, founder and for many years head of the American agency for Swedish steel producers, at Westport, Conn., Sept. 15.

♦ ♦ ♦

William S. Roe, 58, president, William S. Roe Inc., Newark, N. J., at Springfield, N. J., Sept. 3. He founded the company in 1906.

♦ ♦ ♦

Norman L. Daney, 52, treasurer and general manager, Harris-Seybold-Potter Co., Cleveland, printing machinery, in Cleveland, Sept. 13.

♦ ♦ ♦

L. R. Brown, 37, assistant advertising manager, Hagan Corp., Pittsburgh, and formerly with the Mesta Machine Co., Pittsburgh, at Pittsburgh, recently.

♦ ♦ ♦

Emil A. Peterson, 71, president, Valley Iron Works, Appleton, Wis., in that city, Sept. 13. He became superintendent of the plant in 1898, treasurer and general manager in 1905, and president in 1921.

♦ ♦ ♦

J. J. Oller, president, Landis Machine Co., Waynesboro, Pa., in Waynesboro, Sept. 3. Mr. Oller became a director of the company in 1907 and in 1910 was elected president.

♦ ♦ ♦

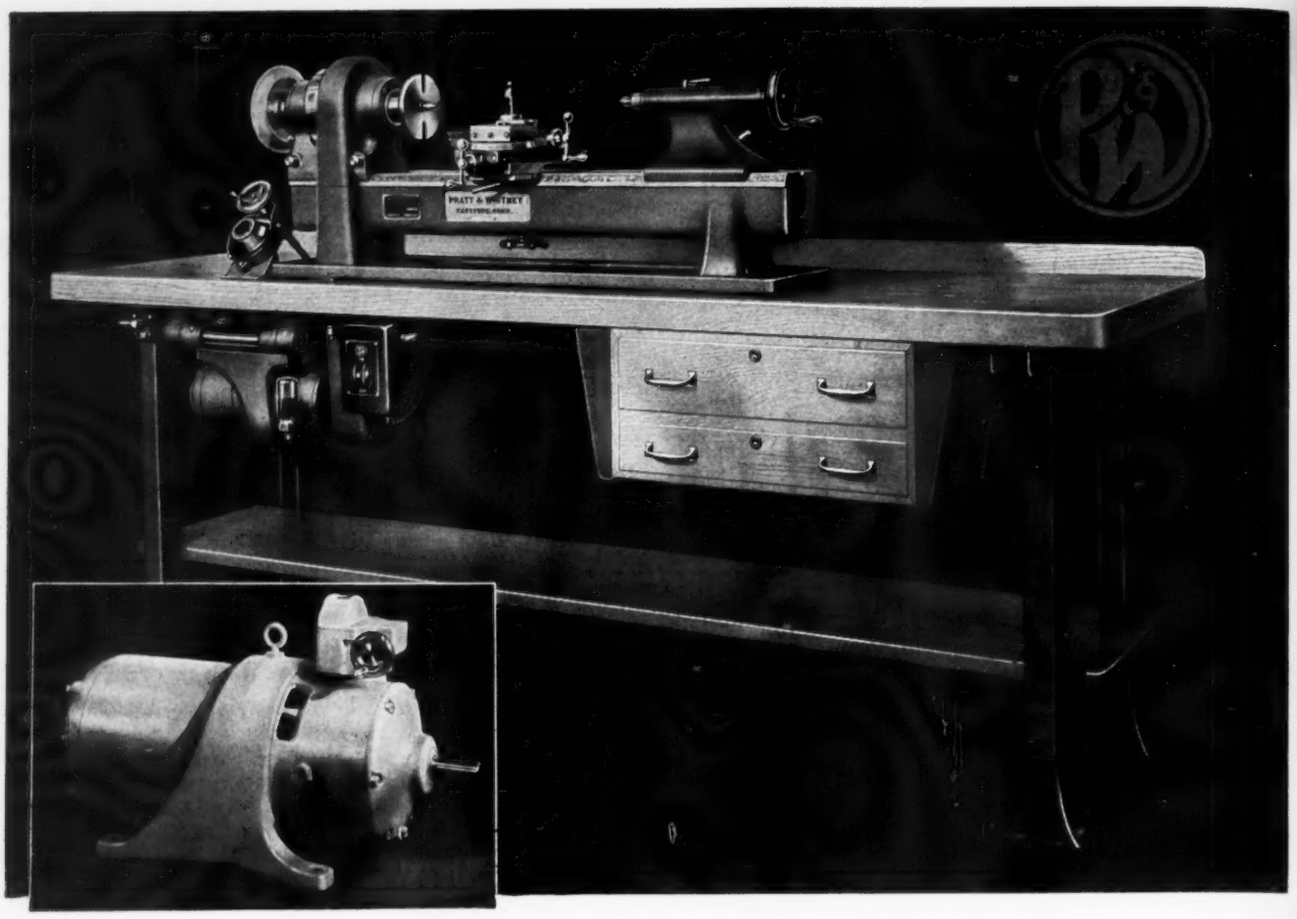
Franklin Sailberlich, 74, since 1892 executive of several metalworking industries in Appleton, Wis., recently. He founded the Eagle Mfg. Co., agricultural tools, in 1892, and served as president until 1918. In 1919 he founded the Fox River Tractor Co. and was its president until 1931.

♦ ♦ ♦

Alex. K. Hamilton, president, M. H. Treadwell Co., Chicago, maker of special machinery, and iron and steel castings, in that city, Sept. 8. Before becoming president of the Treadwell company in 1908, he was chief engineer for the Lackawanna Steel Co., Buffalo, and later chief engineer and general superintendent of Milliken Bros. Inc., Staten Island, N. Y.

♦ ♦ ♦

Edwin R. Crawford, 66, president, McKeesport Tin Plate Co., McKeesport, Pa., in Duquesne, Pa., Sept. 13. He had been associated with the company since 1902. At the age of 15 Mr. Crawford entered the employ of the United States Iron & Tin Plate Co. Inc., as an office boy. Later he was promoted into the shipping department and thence upward until in 1898 he became secretary. From 1899 to 1902 he was traveling auditor for the American Tin Plate Co. In 1902, with associates, he projected the McKeesport company, becoming president. He was a director of the National Can Co., and the Blaw-Knox Co.



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2462

DETROIT

BUICK told the story in a nutshell last week when it epitomized the present automobile market with two crossed brooms. In its large display rooms—which were quite bare—in the General Motors building here, these kitchen brooms supported a placard reading, "Swept clean of 1936 models, watch for the 1937 announcement."

So with the rest of the industry. Field stocks of 1936 have been worked down to a conservative figure, enough so the automobile industry says, for late September sales. Meanwhile, full steam ahead on 1937 production.

In fact, Buick, Olds, Pontiac, Cadillac for General Motors and Dodge and Plymouth for Chrysler last week joined the group that began making new models. Packard and Studebaker had been the forerunners in early September. Now, the list is thus significantly augmented and furthermore it will continue to expand over the rest of the month.

To get this new parade in step has been no child's play. It has meant the rearrangement and retiming of many a plant conveyor system, the rewinding of many an electric motor, the rearrangement of many machine tools and the placing of many a die into trial press runs over these last few weeks. But now the whistle cord is down. A sizeup of today's conditions indicates a busy fourth quarter on the production line.

Expect 1,200,000 New Jobs

In fact, as Oct. 1 and a new quarter draws near the crystalgazers say fully 1,200,000 new jobs will be made during October, November and December. This deduction is built up from Chrysler's schedule of 300,000 units, Chevrolet's avowal of 300,000 assemblies, Ford chipping in with at least 250,000 and the balance of 350,000 strongly supported by Packard, Buick, Olds, Pontiac and Hudson.

So far, of the 23 concerns who make only passenger cars, only two have made known to the public the appearance of their models for the coming season. The next in the swim very likely will be Buick.

Featuring a novel treatment of the front end, Buick will draw away from the solid front shell so characteristic of the present year's jobs. To all outward appearance a band of the sheet from the hood will be drawn straight down the entire length of the radiator, dividing the front shell in two. This dividing section will split two oval-shaped grilles, each made up of short horizontal chrome-plate fins.

The front-on appearance thus is consistent with the wider body and leaves an overall appearance of style. Front headlamps are now mounted closely into the hood replacing the horizontal lamp bracket. Black will be a predominant body color.

Motor Has Few Departures

The motor, still an eight through the entire Buick series, in spite of certain Buick factions that have kept warm the subject of a supplementary six line, has few departures from the present.

One major change in the Buick line affects the lengthening in the "40" series, which had been on a 118-inch wheelbase, but has now been lengthened to become interchangeable with the "60" series, or on a 122-inch base. Hydraulic brakes, the open-type coil spring knee action, as well as turret top and many other 1936 features carry over on the "40", "60", "80", and "90" lines.

Buick has kept its name prominently in the news the last few days, mainly on the announcement that some $14,500,000 has been and is being spent on new productive facilities. For one major point in detail the assembly capacity at Flint has been increased from 800 to 1000 jobs daily.

Among the new buildings Buick is investing in are a transmission unit, a gear and axle plant, a new heat-treating unit and a metallurgical standards division. But most of the fourteen-odd millions has been going into new machinery.

A policy change has been handed down by General Motors that in a sense affects Buick's manufacturing schedules. On the subject of transmissions, Buick was detailed earlier this year to make all for General Motors' subsidiaries except Chevrolet's.

The 1937 schedule was to be enough for 240,000 Oldsmobiles, 200,000 Pontiacs, 170,000 Buicks and 30,000 combined for the Cadillac-LaSalle division, all to come from Flint. However, only recently the transmissions for Cadillac and LaSalle have been taken away and placed again in the West End Cadillac plant.

The story is something like this: That Buick set about in the experimental and planning stages to develop eight variations on the present helical-gear synchro-mesh type transmission. The eight designs finally simmered down to three and the proposal was to make the LaSalle unit interchangeable with the one for the Buick "90" series.

An oil-hardened transmission steel was to be used, but Cadillac and LaSalle turned their noses up at the idea. Oil-hardened it was, so the high-priced General Motors lines took back their transmission manufacture on a case-hardened specification and Buick now goes ahead with its own idea of the proper specification to use. Incidentally, the Cadillac division has definitely given up grinding and is now lapping in its manufacture of gears.

But some measure of pride accrues to the Buick division out of current developments. The new LaSalle body, as already detailed, will be some five or six inches wider in front and back seats, has been given to the Buick Fisher plant for production.

Wood in Cadillac and LaSalle

The LaSalle body this year has been made at Fisher Body at Pontiac. Cadillac's body is still a Fleetwood, made in the nearby Detroit plant. And both bodies, that is LaSalle and Cadillac, will have some wood in them next year, but the rest of the General Motors lines won't, being all steel from sill to roof.

Speaking of changes in the motor industry affecting steel, one of Chevrolet's recent switches, intended for whole-hearted adoption on the 1937 jobs, has been conspicuous.

The specification covering material for the Chevrolet knee-action spring unit has been revised from the former 9250 range to a high-carbon spring steel falling in the 1095 rating. Thus, a carbon steel replaces

alloy, a move reported made to relieve fibre strains.

The springs, which will continue to be formed from round bars, hot-rolled in straight lengths under the "precision round" terminology, are ground by Chevrolet itself at the gear and axle division in Detroit. The size, still .72 inches round, will be unchanged.

Incidentally, all of the other General Motors bar specifications on knee-action springs carry over into 1937. These are six sizes, from 1.05 inches round to .97 inches and so on down the line through Cadillac, Olds, Buick and Pontiac.

Ford is making another contribution to an important departure in steel specifications. Aside from the all-steel top on the coming V-8's, which will add as much as 60 pounds steel per car when formed from a 72 x 137-inch sheet section, Ford has worked out an all-steel floor for the 1937 jobs.

But one weld, that to the oil pan, is used. The floor is formed of a 19-gage, hot-rolled sheet and is corrugated at both ends, making for a valuable strength adjunct to the frame. Though Ford's 1937 bodies will follow the Lincoln Zephyr lines closely and will have a front hood lift with hinges at the cowl, the frame will be conventional.

Conventional Frame Notable

This is an important point in view of the fact that the model being followed has stressed the fact it is built on a bridge-deck type of construction or without a frame. But Lincoln's costly body and its 5000 separate individual welds would be a far cry from the popular version of a low-priced quantity production car. Hence, the conventional frame for the V-8.

The new steel top at Ford has cropped out in several manufacturing problems. No sooner had a 58-inch planer been decided on than Ford's engineers began looking around to see if a 54-inch emery wheel could be especially designed and built for the top's finish.

A 54-inch emery would indeed be an engineering novelty and little conception of the driving power needed is had by the layman. For example, Fisher Body at the new Grand Rapids plant has worked out an emery wheel 30 inches wide for finishing turret tops, but a 100-horsepower motor is needed simply to drive the wheel, with separate motors for the table feed and cooler.

In passing, sagacious observers of the industry have many a comment to offer on the subject of Fisher Body's new Grand Rapids plant. Perhaps because operations have been desultory there, the talk is strong that the new unit is a mighty piece of insurance General Motors took out to guard against any shutdowns at other Fisher plants, such as at Cleveland where a strike two years ago was crippling.

Meanwhile, General Motors' subsidiaries are coming to life in the assembly picture. Most of the parts plant tributary to the Chevrolet assembly line have had two full weeks of work and when the float gets some ten days to two weeks larger, the main line at Flint will start.

Materials and parts enough to build 300,000 Chevrolets in the final quarter have already been ordered. Such a record coming to pass would best the fourth quarter of 1935 by 35,000 jobs, inasmuch as 265,000 models were constructed then.

Pontiac Making Own Axles

Pontiac is rapidly winding up the expenditure of $5,000,000 to $6,000,000 for its new axle plant and effective with the 1937 season becomes self-sufficient on this intricate parts item. The projected 200,000 assemblies for the 1937 season will be 25,000 over assured 1936 sales and up widely from production of 75,000 jobs in 1934. Pontiac began assembling its new line Sept. 21.

This country, of course, has placed its automobile shows in November, but as a matter of fact at every month of the year it's show time somewhere in the world.

The Paris and London shows, which will predate New York by a month, have drawn a few 1937 hand-built cars from American plants. For instance, Cadillac shipped several of its new models from Detroit last week for the French and English shows.

Beginning this week Hudson starts the assembly line on the first of its 1937 models. The first cars are scheduled to come through somewhat widely spaced and many in the final analysis will be hand-built. But when the distributors are called in Sept. 29 a full line will be shown. Hudson's announcement to the public will be somewhere around Oct. 10.

The big push that Packard is putting on this year hits directly at Hudson, for both, being the outstanding "independents", are keen after fourth position behind General Motors, Chrysler and Ford.

No better evidence of the scramble in the Packard six-Hudson-Terraplane bracket exists than in the news on Hudson's dealerships. Since the 1936 Hudsons have been out the company has added 1200 new distributors, but has dropped about 900, leaving a net of 300, but also a 75 per cent turnover.

Part of the story is that, especially on the Pacific coast, Packard and Hudson were being jointly handled by one distributor. Divorcing these partnership arrangements, and setting up its own dealers on the Hudson line only has been what the company has sought.

Hudson Attains Goal

True to its October, 1935, prediction that it would make over 100,000 cars this year and that 104,000 units definitely was the 1936 goal, Hudson did the trick. A total of 101,704 units of the 1936 jobs were shipped, compared with 74,056 on the 1935 lines.

Aimed at the racketeers of reconditioned spark plugs, federal judge Edward J. Moinet at Detroit last week ruled that used plugs must have original names obliterated, must be painted red and stamped "used". . . . Chevrolet sold 95,905 new units in August and its dealers, 165,197 used cars. . . . Murray Body is making its newly-won share of the Plymouth frame contract at its Ecorse, Mich., plant. . . . Average Buick employment this year has been 13,561 men per month; in 1935 it was 9000-odd. . . . Pontiac is having a preview on its new lines Oct. 7.

Automobile Production

Passenger Cars and Trucks—U. S. Only
By Department of Commerce

	1934	1935	1936
Jan.	155,666	289,728	364,004
Feb.	230,256	332,231	287,606
Mar.	338,434	425,913	420,971
Apr.	352,975	452,936	502,775
May	330,455	361,107	460,565
June	306,477	356,340	452,955
July	264,933	332,109	440,999
7 mo.	1,979,196	2,550,364	2,929,875
Aug.	234,811	237,400	.....
Sept.	170,007	87,540	.....
Oct.	131,991	272,043	.....
Nov.	83,482	395,059	.....
Dec.	153,624	404,528	.....
Year	2,753,111	3,946,934	.....

Estimated by *Cram's Reports*

Week ended:

Aug. 22	73,709
Aug. 29	53,037
Sept. 5	31,628
Sept. 12	26,750
Sept. 19	33,615

The Research was done, the Alloys were developed and most Die Castings are specified with

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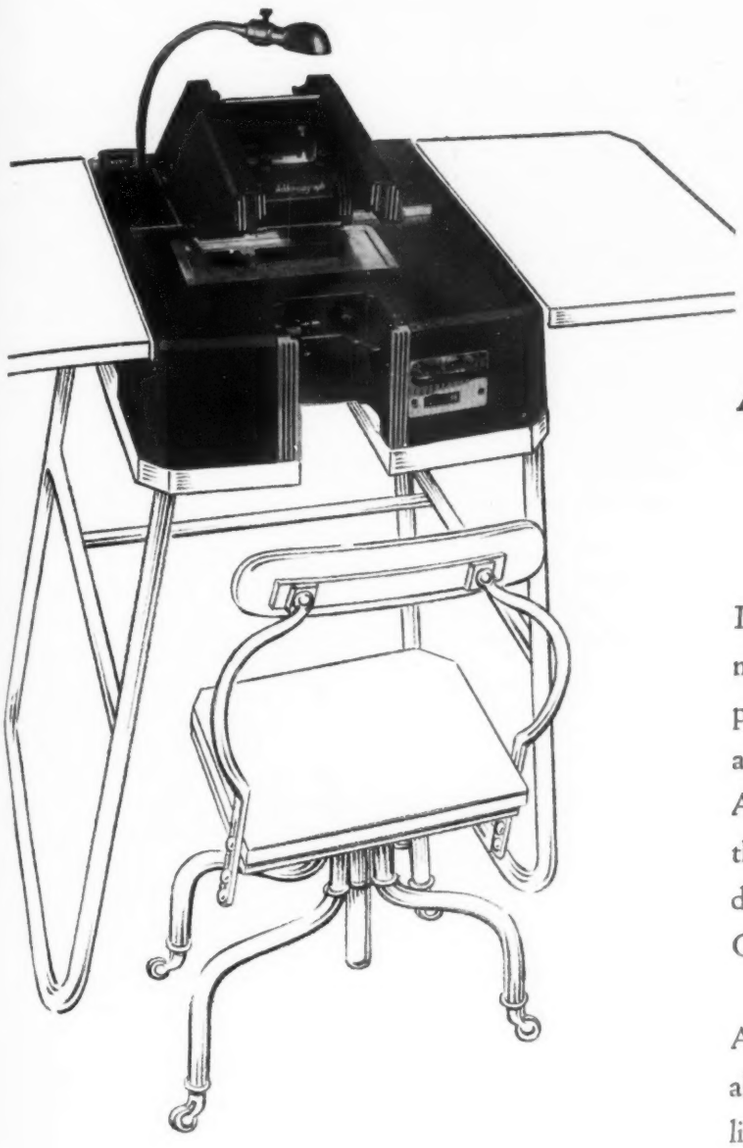

ADDRESSOGRAPH'S SECRET

In order to reach a broad market, a business machine must be built to sell at the lowest possible cost, must be light weight, compact and of pleasing appearance. According to Addressograph-Multigraph Corporation, these factors were achieved largely by careful designing and the use of ZINC Alloy Die Castings in every possible application.

Due to the strength of modern ZINC Alloy Die Castings in thin sections, they were able to employ more compact mechanism, lighter springs and supports. The uniformity of these castings allowed the specification of closer clearances between operating parts.

The probabilities are that you are not designing or manufacturing business machines, but the chances are you have a vital interest in the lower manufacturing costs and compact design of your products. ZINC Alloy Die Castings are achieving these results in many products.

We try to keep abreast of the Die Casting industry in our publication, *The Alloy Pot*. We will gladly place your name on our mailing list to receive the literature on this subject if you so desire.

THE NEW JERSEY ZINC COMPANY

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New Jersey Zinc

Dairy Use of Stainless Steel Is Increasing

A substantially increased volume of orders for stainless steel sheets from dairy equipment fabricators during the past 90 days, indicates a profitable trade resumption as well as a generally healthy tone throughout the industry, declares W. F. Detwiler, executive vice president of Allegheny Steel Co.

"Since 1925, the Allegheny Steel Co. has pioneered in development of stainless steel alloys for equipment used in the transportation, processing and storage of milk and other dairy products. The company's record and many years of service has culminated in the application of its alloys in all branches of the industry today," he pointed out.

"Allegheny metal, the company's well-known stainless steel product, enables modern day dairies to maintain maximum cleanliness and sanitation. Being insoluble in lactic acid and possessing corrosion-resistant qualities, Allegheny metal not only reduces maintenance and depreciation costs, but further insures dairy products against the dangers of spoilage and off-taste due to metallic influence," Mr. Detwiler concluded.

Carnegie-Illinois Has New Alloy Trademark

The new trade name USS Carilloy to identify alloy steels produced by Carnegie-Illinois Steel Corp., Pittsburgh, has been announced.

The announcement emphasizes that the new name USS Carilloy does not signify a new product, nor does it apply to any single alloy steel. It is simply a new trade designation which will serve as a quality trademark for the entire group of alloy steels previously marketed as "Carnegie-Illinois Alloy Steels."

Wage Rates Unchanged

Wage rates in sheet and tin plate mills having contracts with the Amalgamated Association of Iron, Steel and Tin Workers will be unchanged, at 17 per cent above base, during September and October. Average sales price of Nos. 26, 27 and 28 gage plain sheets for July and August was reported by the Western Sheet and Tin Plate Manufacturers association as 2.65c. When the current contract between the two associations was renewed in July a 2 per cent advance was made in the base rates.

Wages of puddlers and roll employes on bar and guide mills will be unchanged for September-October, following the bi-monthly examination of sales sheets of the Western Bar Iron association. The card rate for boiling, bar and 12-inch mills continues at 2.00c and on guide and 10-inch mills at 2.10c. The current wage rate for puddlers based on these rates is $11.80 per ton.

Convention Calendar

Sept. 21-22—Associated Machine Tool Dealers. Fall meeting at Granville Inn, Granville, O. John Sauer Jr., 2921 East Grand boulevard, Detroit, is secretary.

Sept. 21-26—Iron and Steel institute (British). Autumn meeting in Dusseldorf, Germany. K. Headlam-Morley, 28 Victoria street, London S.W.1, is secretary.

Sept. 22-25—Association of Iron and Steel Engineers. Thirty-second annual convention at Hotel Statler and Iron and Steel exposition at Convention Hall, Detroit. Brent Wiley, Empire building, Pittsburgh, is managing director.

Sept. 28-Oct. 3—American Mining congress. Conference of metal mining industries at Civic auditorium, Denver under auspices of Western division. Stanly A. Easton, president, Bunker Hill & Sullivan Mining & Concentrating Co., San Francisco, is chairman of the program committee.

Oct. 1-2—Porcelain Enamel institute. Sixth annual meeting at Hotel Statler, Cleveland. George P. Mac Knight, 612 North Michigan avenue, Chicago, is secretary.

Oct. 5-7—National Industrial Advertisers association. Annual conference at Benjamin Franklin hotel, Philadelphia. M. R. Webster, 100 East Ohio street, Chicago, is secretary.

Oct. 5-9—National Safety council. Twenty-fifth annual safety congress in Atlantic City, N. J. William H. Cameron, 20 North Wacker drive, Chicago, is managing director.

Oct. 5-10—Fourth Annual Industrial Materials exhibit. At Hotel Roosevelt, New York. S. S. Kahn, Parker-Kalon Corp., 200 Varick street, New York, is secretary.

Oct. 8-10—Electrochemical society Fall meeting at Hotel General Brock, Niagara Falls, Ont. Dr. Colin G. Fink, Columbia university, New York, is secretary.

Oct. 15-17—Society of Automotive Engineers. First National Aircraft Production meeting at Ambassador hotel, Los Angeles. John A. C. Warner, 29 West Thirty-ninth street, New York, is general manager.

Oct. 16—Eastern States Blast Furnace and Coke Oven association. Joint meeting with Chicago District Blast Furnace and Coke association at Palmer House, Chicago. B. A. Standerline, Wisconsin Steel Co., Chicago, is secretary of the Chicago District association.

Oct. 19-22—American Institute of Mining and Metallurgical Engineers. Fall meeting of Institute of Metals and Iron and Steel divisions at Hotel Statler, Cleveland. Louis Jordan, 29 West Thirty-ninth street, New York, is secretary.

Oct. 19-22—National Wholesale Hardware association. Forty-second annual convention at Marlborough-Blenheim hotel, Atlantic City, N. J. George A. Fernley, 505 Arch street, Philadelphia, is secretary.

Oct. 19-22—Wire association Annual meeting at Hotel Cleveland, Cleveland, Richard E. Brown, 17 East Forty-second street, New York, is secretary.

Oct. 19-23—American Society for Metals. Eighteenth annual National Metal congress and exposition in Public Auditorium, Cleveland. W. H. Eisenman, 7016 Euclid avenue, Cleveland, is secretary.

Oct. 19-23—American Welding society. Seventeenth annual meeting at Hotel Cleveland, Cleveland. M. M. Kelly, 33 West Thirty-ninth street, New York, is secretary.

Oct. 19-23—American Gas association. Annual meeting and exhibition at Auditorium, Atlantic City, N. J. Kurwin R. Boyes, 420 Lexington avenue, New York, is secretary.

Oct. 20—National Association of Sheet Metal Distributors. Twenty-fifth annual meeting at Marlborough-Blenheim hotel, Atlantic City, N. J. George A. Fernley, 505 Arch street, Philadelphia, is secretary.

Oct. 21-23—American Institute of Steel Construction. Fourteenth annual meeting at Greenbrier, White Sulphur Springs, W. Va. V. G. Iden, 200 Madison avenue, New York, is secretary.

Oct. 22-23—American Society of Mechanical Engineers. Fall meeting of Iron and Steel, Machine Shop Practice and Applied Mechanics divisions at Hotel Cleveland, Cleveland. P. T. Wetter, 29 West Thirty-ninth street, New York, is assistant secretary.

Oct. 29-30—Iron and Steel institute (British). Special autumn meeting at Institution of Civil Engineers, London. K. Headlam-Morley, 28 Victoria street, London S. W. 1, is secretary.

Oct. 30-31—Foundry Practice conference. University of Iowa, Iowa City, Iowa. Sponsored by college of engineering, American Foundrymen's association and Northern Iowa Foundrymen's association.

Nov. 18-19—National Founders' association. Fortieth annual meeting at Waldorf-Astoria hotel, New York. J. M. Taylor, 29 South LaSalle street, Chicago, is secretary.

Nov. 18-20—International Acetylene association. Thirty-seventh annual convention at Hotel Jefferson, St. Louis. H. F. Reinhard, 30 East Forty-second street, New York, is secretary.

Nov. 18-20—National Foreign Trade council. Twenty-third annual convention in Chicago. Lindsay Crawford, 26 Beaver street, New York, is secretary.

Nov. 30-Dec. 4 — American Society of Mechanical Engineers. Fifty-seventh annual meeting at Engineering Societies building, New York. C. E. Davies, 29 West Thirty-ninth street, New York, is secretary.

Nov. 30-Dec. 5—National Exposition of Power and Mechanical Engineering. Thirteenth national exposition at Grand Central Palace, New York. Charles F. Roth, Grand Central Palace, New York, is manager.

WASHINGTON

THE antitrust division of the department of justice bit off more than it anticipated when it began its investigation into alleged collusive bidding in the steel industry.

John Dickinson, asistant attorney general in charge of the investigation, which is being made at the request of President Roosevelt, stated that while he had anticipated making quick work of the job and perhaps limiting the field work to Pittsburgh, he has now decided to go into all of the steel producing districts of the country. Various points in Ohio, in addition to Pittsburgh, Birmingham, Chicago and other centers, will be combed by operatives of the department.

From Mr. Dickinson's statement it is inferred that the four companies originally mentioned by Secretary Ickes will not be the only ones in the investigation. "All lines of steel" are being looked into by the investigators, said Mr. Dickinson, who explained that the investigation is "coming along" and that he is making every effort to "speed up" the work, but it is a "big job." He refused to guess when the field work would be completed and said that the enlargement of the investigation was due to additional information furnished to the department of justice by various government purchasing officers

ROPER SAYS LONG, UPWARD SWING IS NOW UNDER WAY

Secretary of Commerce Roper at a press conference last week said that in his opinion industry is now starting a long upward swing toward prosperity.

He thinks we are entering one of the greatest industrial eras of history, but he believes that certain segments of business should be kept from sudden and prolonged booms.

Mr. Roper called attention to the fact that while in some industries production is as high as it was in 1929, employment has not equaled that predepression level. He considers that greater efficiency and improved machinery may be partly responsible. Also he says that industry in 1929 may have been carrying greater payrolls during those prosperous years than it really needed.

At present, Mr. Roper said, business is feeling its way to ascertain whether it has really started the upward swing. Employment, he believes, will go ahead in a normal fashion, helped greatly by new industries, including a major building program to run anywhere from five to ten years, and air conditioning.

At a conference with his business advisory council Secretary Roper took up the question of establishing in his department a bureau or division of industrial economics to be comparable with a similar bureau now in the department of agriculture, as first noted in this column a few weeks ago.

The purpose of this new work, he told the council, would be to analyze business and industry in any way that the business men of the country desire and it would take up some phases of industry which are not touched by the department of commerce.

Mr. Roper told the council it would not be necessary for him to get any additional authorization from congress outside of an appropriation, a small amount at first, so that the bureau could "feel its way." This division would have the old files of the NRA as a starting point in case that information should be of any value. It is reported that members of the council are enthusiastic about the possibilities of such a division.

MACHINERY "ANALYSIS" INCLUDES PROPAGANDA

An analysis of the machinery industry has been prepared by George L. Berry's council for industrial progress and, as in the case of the steel industry some weeks ago, the council has taken the bureau of the census figures and made them stand for what Major Berry wants them to mean.

The so-called co-ordinator for industrial co-operation says that "although a terrific drop in the value of products of this industry for the years 1929-1933 would appear to indicate a backlog of gread demand for replacement in older factories and new machinery for new products and new types of mechanization, the current trend of dealing with works, if continued, would not permit that demand, whenever it is released into the market, to bring a corresponding rise in wage earnings and consuming power." This comes from the man who all along has urged industry to help him with his council.

The council in its alleged analysis of this industry states that wage earners engaged in the manufacture of machinery and parts, not including transportation equipment, dropped more than one-half in number in the four depression years following the 1929 collapse.

Claims Labor Falls Behind

The number of workers in this industry group, the analysis shows, was 1,091,269, but four years later the total dropped to 538,593. This figure was lower than the employment in this industry group in 1914, when it stood at 618,737.

It is pointed out in the survey that the value added by the manufacturing of raw materials into machinery dropped from the high peak of $4,349,000,000 in 1929 to a low point of $1,280,000,000 in 1933. This figure was still higher, however, than the value added of $919,000,000 in 1914. The value added by manufacturing climbed to $2,975,000,000 during the World war years, with a corresponding increase in employment.

The council states that the percentage of this increased value added by manufacturing processes, which

went to workers in the form of wages, dropped slightly during the period from 1914 to 1919, standing originally at 44.9 per cent and dropping to 44.4 per cent. A greater decline is shown in the following decade, and in 1929 the workers engaged in making machinery received only 37.6 per cent of the value which their efforts created, says the council. There was some slight increase in this figure during the depression, and in 1933 the workers received in wages 39.2 per cent of the added value.

Productivity of the workers followed a somewhat similar trend, the analysis states. In 1914, the average productivity per wage earner was $1486. This figure almost doubled to $2800 in 1919, climbed higher to $3984 in 1929, and dropped in 1933 to $2377.

MACHINE TOOL DEMAND IN GREAT BRITAIN IS HIGH

Industrial expansion in Great Britain has been reflected in an appreciably increased demand in that market for machine tools of all kinds, according to a report to the commerce department from Trade Commissioner E. B. Lawson, London. A substantial part of this demand, it is pointed out, has developed from the government's augmented program for a larger air force.

It is apparent, the report states, that the total British imports of machine tools during 1936 will greatly exceed in value those recorded for many years past.

Official statistics covering the first six months of this year show that imports into the United Kingdom of metalworking machine tools were valued at $7,500,000, an increase of 90 per cent compared with the corresponding period of 1935. Receipts from the United States, the outstanding supplier of such items, totaled $4,425,000, an advance of 98 per cent over the first half of 1935. It is estimated that approximately 28 per cent (by value) of the total imports of metalworking machine tools into Great Britain in the first half of 1936 were lathes. Milling machines and grinding machines, both of which are produced locally in substantial volume, were also important items in the import trade.

Germany and Switzerland are the chief competitors of the United States in the British machine tool market. The strength of American manufacturers, it is pointed out, lies chiefly in the field of lathes, grinding machines and presses.

DRAWBACK EXTENDED

Extension of drawback has been granted by the treasury department to the Taylor-Wharton Iron & Steel Co., High Bridge, N. J. The department had allowed drawback on manganese steel castings manufactured by this company with the use of imported ferromanganese or ferromanganese produced under drawback regulations and the department has now extended a permit to the same company to manufacture its castings with the use of imported silicomanganese or silicomanganese produced by firms operating under drawback regulations.

IRON AND STEEL INDUSTRY SHOWS GAINS IN MAINE

In 1935 there were 25 iron and steel and their products plants in Maine, not including machinery, compared with 19 in 1933, according to preliminary figures compiled by the bureau of the census.

The bureau's figures show that in 1935 these plants had 777 wage earners, compared with 583 in 1933 and their 1935 wages totaled $818,592, compared with $566,961 in 1933. The value of the products produced by these plants in 1935 was $6,299,938 compared with $3,663,757 in 1933.

In the same tabulations the bureau shows that in 1935 there were 44 machinery plants, not including transportation equipment, compared with 35 in 1933. In 1935 these plants had 3187 wage earners, compared with 2268 in 1933, while the wages paid in 1935 totaled $3,079,451 compared with $1,955,957 in 1933. The value of the products produced by these plants in 1935 was $8,185,107 compared with $4,855,711 in 1933.

JULY SHIPMENTS TO SPAIN INCREASE IN SOME LINES

July export figures to Spain, which really show the trend of our trade to that country due to the civil strife, are just available at the department of commerce. In general, they show that up to July our exports of iron and steel products increased while our machinery exports decreased.

During July of this year the United States shipped 272 tons of iron and steel products to Spain, compared with 48 tons for the same month last year, while for the month of June this year the exports totaled 527 tons, compared with only 41 tons in June, 1935.

For the first seven months of this year ending in July, our iron and steel exports to Spain totaled 3452 tons compared with 351 tons for the corresponding period of last year.

For the first seven months of this year 1186 tons of scrap were exported to Spain, compared with only 453 tons for the same seven months of last year. In June of this year we shipped 683 tons of scrap to Spain with none the previous June and in July of last year we exported 100 tons of scrap to Spain with none in July of this year.

In July of this year our exports of machinery to Spain were valued at only $80,038, compared with $301,023 for the same month of last year, showing the effect of the war there to our machinery business.

In July of last year our electrical machinery exports were valued at $151,514, being reduced in July of this year to $52,309. Industrial machinery valued at $70,596 was exported in July of last year, being reduced in the same month of this year to $18,877. Agricultural machinery exports in July of last year were valued at $40,796 and in the same month of this year they were valued at only $5279.

BENEFIT IN RETURNING GERMAN COLONIES QUESTIONED

A report on "Raw Materials in World Politics," prepared for the foreign policy association of this city by John C. deWilde, one of its experts, while making no reference to Hitler's recent declarations, states that the return of Germany's former colonies "would bring little relief" to the third Reich. He says that the transfer of colonies is no final solution to the raw materials problem for Germany, or for Italy or Japan.

An analysis of the geographical distribution of raw materials leads to this conclusion, Mr. deWilde states. The percentage of some important materials produced in colonies and dependencies includes iron, 3.81 per cent, and manganese 15.19 per cent.

LEWIS UNFOLDS DREAM OF $2500 A YEAR WAGE SCALE

John Lewis, talking over a radio hookup last week, declared that a minimum income of at least $2500 a year for unskilled labor would be possible under proper planning.

He dwelt on the benefits which should accrue to labor if it were organized to the same degree as employers and other social groups.

"Able economists have already shown that the entire scope of American life, social, economic, physical, and spirtual, may be vastly improved," said Mr. Lewis. "Under proper planning and regulation, American industry, after general returns have been distributed to invested capital, could easily pay a minimum income to unskilled labor of at least $2500 a year.

"Above this minimum could be added differentials in accordance with productive ability for skilled craftsmen, technical, professional and executive classifications. Such wage and salary standards could also carry with them a 30-hour week.

"Does anyone doubt," he asked, "that the workers in our great industries would organize but for the determined opposition of corporate management? Why do they resort to company controlled unions and employe representation agencies, and the studied practice of discharging those advocating labor unions?"

Editorial

Demonstrate How Industry Benefits Your Community

IT IS an adage that people who live closest to the soil have a better appreciation of the fundamentals of economics than those who dwell in urban centers. The conservatism of American farmers and the thrift of French ruralists usually are cited in support of this theory.

Recent experience in the United States has furnished further corroboration. It is significant that most of the currently offered panaceas which are unsound economically, if not absurd and ridiculous, find greater acceptance in the large cities than in smaller communities. Many of the political demagogues who are sponsoring "something for nothing" ideas find an encouraging measure of support in centers of dense population but make hardly any impression in smaller cities, towns and rural districts.

This suggests that the complexity of one's environment has much to do with his ability to understand the essentials of economics. The elements entering into the creation of wealth are more clearly apparent to the farmer because most of them are visible to the eye. The man in the village or small town also has a good opportunity to know and to appreciate the relation of income to outgo. But the ordinary citizen in a metropolitan area lacks this advantage. He produces few if any of his own needs. He does not realize what is involved in providing him with shelter, food and clothing. The economics of his environment are so complex that he cannot and does not attempt to understand.

Demagogues Find Receptive Audiences in Urban Centers; Elsewhere Interest Lags

Perhaps that explains why the masses in the cities are easy prey for unscrupulous politicians. The aspiring office holder who damns industry as a public enemy can make headway in a congested slum district whereas he would be checked up sharply if he were to preach the same doctrine in a locality where the role of industry in the economic structure of the community is better understood.

Obviously it is the duty of citizens everywhere to encourage the dissemination of sound economic principles to the end that the votes of uninformed victims of political demagogues will not prevail in the selection of aspirants for public office. Some way must be found to convince the man in the street that industry is not Public Enemy No. 1, that a prosperous industry is compatible with the prosperity of the general public, and that there is a practical limit to the extent to which public funds can be distributed freely on the "something for nothing" basis.

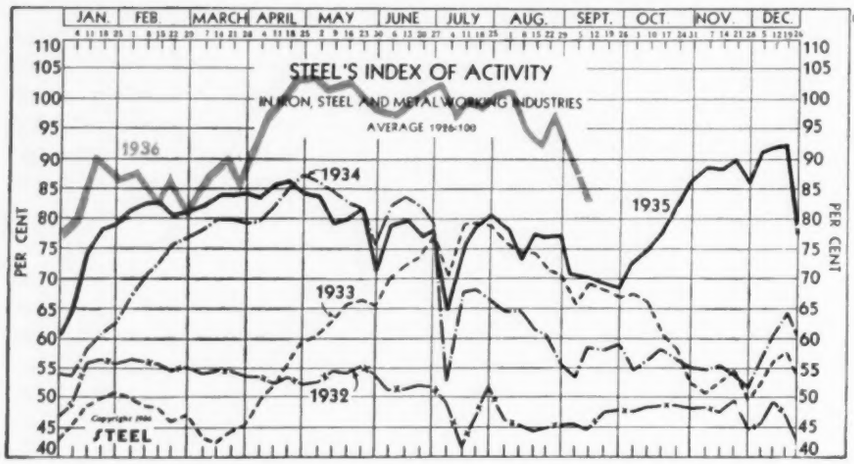
This can be accomplished quite effectively in all localities, except perhaps in the very largest cities. In any community up to one of about 250,000 population it ought to be comparatively easy to establish beyond question the importance of industry to the locality. In a mass meeting of industrialists, merchants, bankers, labor leaders, professional men, etc. it should be possible to prove conclusively that industry is the keystone in the arch of community welfare. The task is particularly simple in a city of moderate size, because in that situation all that is necessary is to show what the local industries mean to the community in terms of taxes paid, payrolls distributed and other disbursements to the welfare of the locality.

Try Indentifiable Money; It Will Convince Local Merchants That Industry Is Important

Should there be any doubt on this point, there is a simple expedient by which any community can dramatize the importance of industry to its citizens. Simply arrange that the next payment of wages by the principal employer shall be in identifiable money. One method is to use silver dollars, which in the eastern part of the United States are circulated so sparingly that their appearance in quantity will excite attention and interest. A payroll paid off in silver will show up dramatically in the receipts of grocers, dentists, doctors, bankers, drug stores, department stores, savings and loan associations, etc. to the extent that the mercantile populace of the community will admit, without question, that the funds distributed by the X Y Z Mfg. Co. are a vital factor in the welfare of the community. When all other arguments fail, this demonstration drives home effectively the idea that industry is a constructive enterprise and one that should not be hamstrung by politics.

To industrialists everywhere—in large cities and smaller communities—we urge an intelligent campaign for the appreciation of the role of industry. Win the co-operation of the bankers, tradesmen and professional men of your community and you will defeat the selfish political aspirations of destructive political demagogues.

THE BUSINESS TREND



STEEL'S *index of activity in the iron, steel and metalworking industries declined 4.5 points to 83.0 in the week ending September 12:*

Week ending	1936	1935	1934	1933
June 27	101.9	78.4	79.4	77.0
July 4	97.5	64.1	52.3	71.4
July 11	100.9	76.5	67.8	79.1
July 18	99.9	79.8	68.1	79.4
July 25	102.1	80.8	66.4	78.8
Aug. 1	102.5	78.4	64.8	75.9
Aug. 8	98.7	73.4	64.6	74.7
Aug. 15	92.6	77.5	61.4	74.2
Aufl. 22	97.7	77.0	60.3	71.6
Aug. 29	94.0	77.3	55.1	70.3
Sept. 5	87.5†	70.9	53.5	65.5
Sept. 12	83.0*	70.1	58.7	69.1

†Revised. *Preliminary.

The index charted above is based upon freight car loadings, electric power output, automobile assemblies (estimated by Cram's Reports) and the steelworks operating rate (estimated by STEEL*). Average for 1926 equals 100, weighted as follows: Steel rate 40, and car loadings, power output and auto assemblies each 20.*

Changed Auto Schedule Is Revamping Business Trend

IN RECENT years the path of the index of industrial activity through the summer months —say from July 4 to mid-September—has been fairly consistent. Therefore it is rather strange that the curve for the same period of 1936 does not conform to the same pattern.

In 1932, 1933, 1934 and 1935, the index of activity dipped precipitately in the weeks which included the July 4 holiday. In 1936 the interruption caused by this off-day was very slight.

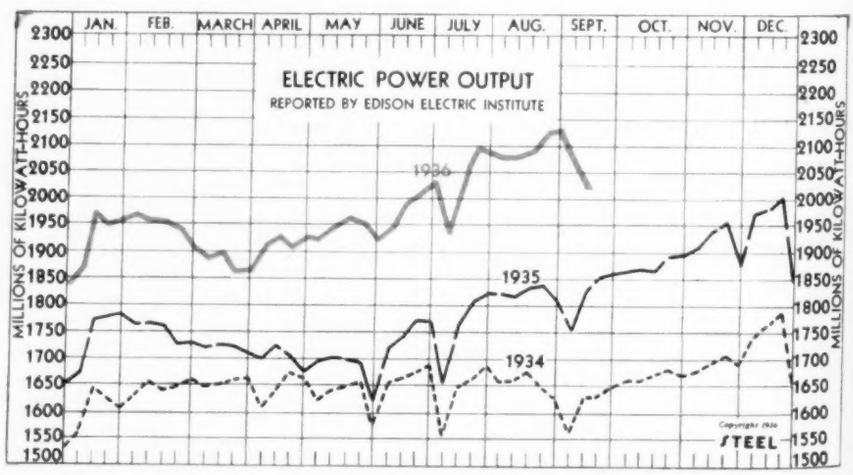
In the four previous years the observance of Labor day was reflected by relatively minor dips in the index whereas in 1936, the decline occasioned by Labor day was quite severe. There must be a significant reason why the sharpest recessions occurred in the July 4 week in 1932, 1933, 1934 and 1935 and in the Labor day week in 1936.

The explanation lies in the behavior of the principal factors in industrial activity. A study of the declines in Labor day week from 1932 to 1936 inclusive shows that car loadings and electric power output have dipped consistently in all five years. The record for steelworks operations has been only slightly inconsistent in that the rate gained in 1932, declined moderately in 1933, fractionally in 1934 and 1935, and again moderately in 1936.

Most erratic is the record furnished by automobile output. It gained in the Labor day weeks of 1932 and 1934, dropped moderately in 1933 and 1936 and dipped sharply in 1935.

The conclusion is that the interruption in activity due to Labor day in 1936 has been accentuated by the change of the automobile season. The new timing of the introduction of new models is revamping the pattern of the seasonal trend of business.

	Millions Kw.-Hrs.			
	1936	1935	1934	1933
Sept. 12	2028	1827	1633	1663
Sept. 5	2098	1752	1564	1582
Aug. 29	2135	1809	1626	1637
Aug. 22	2125	1839	1648	1630
Aug. 15	2094	1832	1674	1650
Aug. 8	2079	1819	1659	1627
Aug. 1	2079	1821	1657	1650
July 25	2008	1823	1683	1661
July 18	2099	1807	1663	1654
July 11	2029	1766	1647	1648
July 4	1940	1655	1555	1538
June 27	2029	1772	1688	1655
June 20	2005	1774	1674	1598
June 13	1989	1742	1665	1578

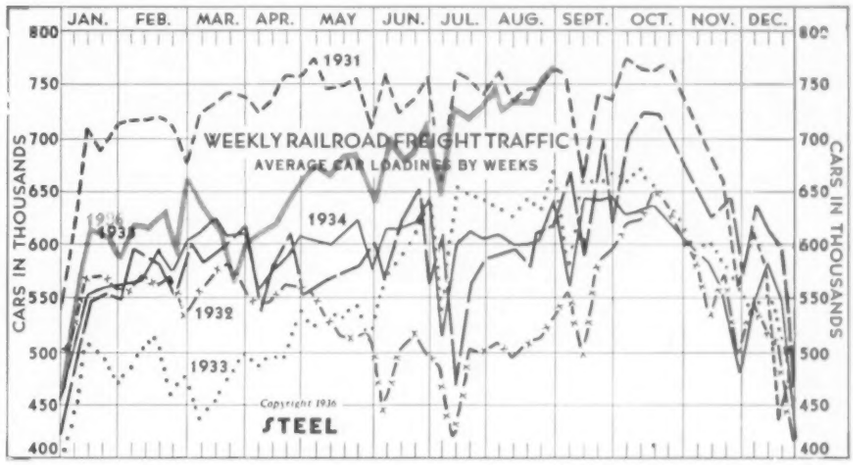


Finished Steel Shipments Off Slightly in August

	Gross Tons		
	1936	1935	1934
Jan.	721,414	534,055	331,777
Feb.	676,315	583,137	385,500
March	783,552	668,056	588,209
April	979,907	591,728	643,009
May	984,097	598,915	745,063
June	886,065	578,108	985,337
July	950,851	547,794	331,777
Aug.	923,703	624,497	378,023
Sept.		614,933	370,306
Oct.		686,741	343,962
Nov.		681,820	366,119
Dec.		661,515	418,630

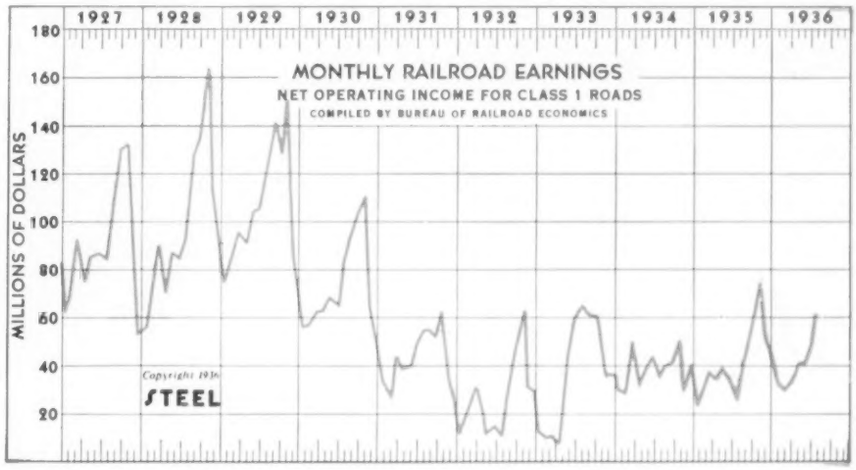
Freight Car Loadings Highest Since 1931

	1936	1935	1934
Sept. 5	764,680	592,786	562,706
Aug. 29	753,742	679,861	645,800
Aug. 22	734,973	625,774	606,917
Aug. 15	736,497	614,005	601,788
Aug. 8	728,293	583,743	602,530
Aug. 1	747,551	597,083	611,298
July 25	731,062	596,462	608,800
July 18	720,402	593,366	614,900
July 11	724,324	566,488	602,800
July 4	649,759	472,421	519,800
June 27	713,639	618,036	644,600
June 20	690,716	567,847	621,900
June 13	686,812	653,092	617,600



Class I Railroads Earn 2.30 Per Cent in Seven Months

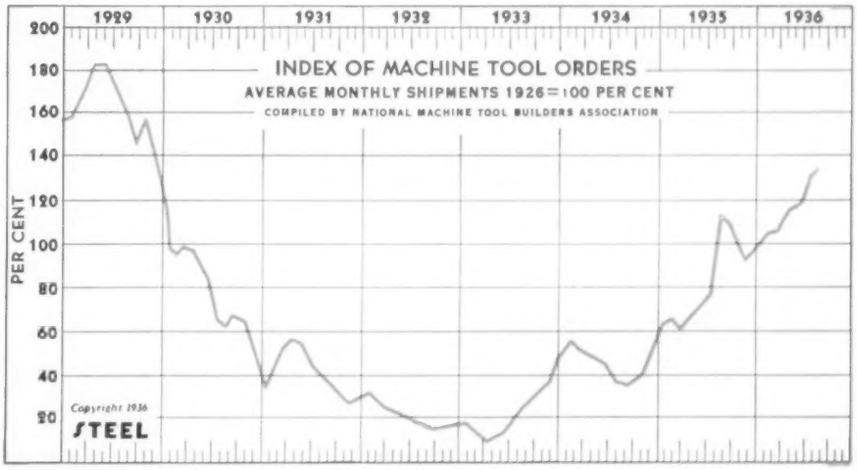
	1936	1935	1934
Jan.	$35,764,748	$21,348,557	$31,058,275
Feb.	33,594,718	25,719,919	29,420,772
March	35,205,513	37,850,965	52,217,083
April	41,547,644	45,625,786	32,433,939
May	41,842,147	39,505,069	39,699,194
June	50,312,580	34,102,703	42,037,757
July	61,773,765	26,919,343	35,441,265
Aug.		42,074,108	40,564,071
Sept.		57,359,339	41,713,425
Oct.		75,425,092	49,336,307
Nov.		54,234,305	32,540,502
Dec.		46,040,165	38,738,295



August Machine Tool Index Continues Upward Trend

Three Months Average

	1936	1935	1934	1933
Jan.	102.6	61.3	56.5	18.3
Feb.	107.1	61.5	58.2	15.2
March	109.4	60.3	50.9	11.1
April	114.4	60.3	48.5	8.3
May	116.6	67.1	46.8	10.6
June	124.5	76.7	42.6	15.5
July	132.6	94.7	38.6	22.4
Aug.	135.5	112.2	37.1	27.9
Sept.		108.5	37.4	30.9
Oct.		102.9	40.5	33.3
Nov.		93.8	44.2	38.0
Dec.		99.9	54.1	51.0



Scraping Machine Tool Surfaces Calls for High Degree of Skill

BY FRED B. JACOBS

GENERATION of plane surfaces by chipping, filing and scraping is an old mechanical process which antedates the introduction of the metal planer by many years. Thus it is a process born of necessity. The making of accurate master planes by the well-known process of scraping three surface plates or straightedges together is generally credited to that eminent master mechanic to whom the mechanical world owes so much, Joseph Whitworth. It is said that Whitworth devised this method while working for Henry Maudslay in London about 1825.

Be that as it may, the scraping of plane surfaces to true bearings today is practiced in nearly every machine tool building plant. Hand scraping of true plane bearings is a fine art calling for considerable skill and is usually done only by men long trained in the art. In this article are outlined briefly methods followed at the plant of the Cincinnati Milling Machine Co., Cincinnati.

Bearing surfaces as they come to the machinists who do the scraping are finished by milling in the majority of cases. By using substantial milling machines of its own design furnished with cutters of its own design of the most approved types the company is enabled to mill the bearing surfaces with a degree of accuracy which would be thought impossible a generation ago. Scraping generally is divided into two operations, rough scraping and finish scraping.

The operation shown in Fig. 1, involves rough scraping. In this case it is necessary to generate a fairly accurate bearing inasmuch as the milling machine column in the illus-

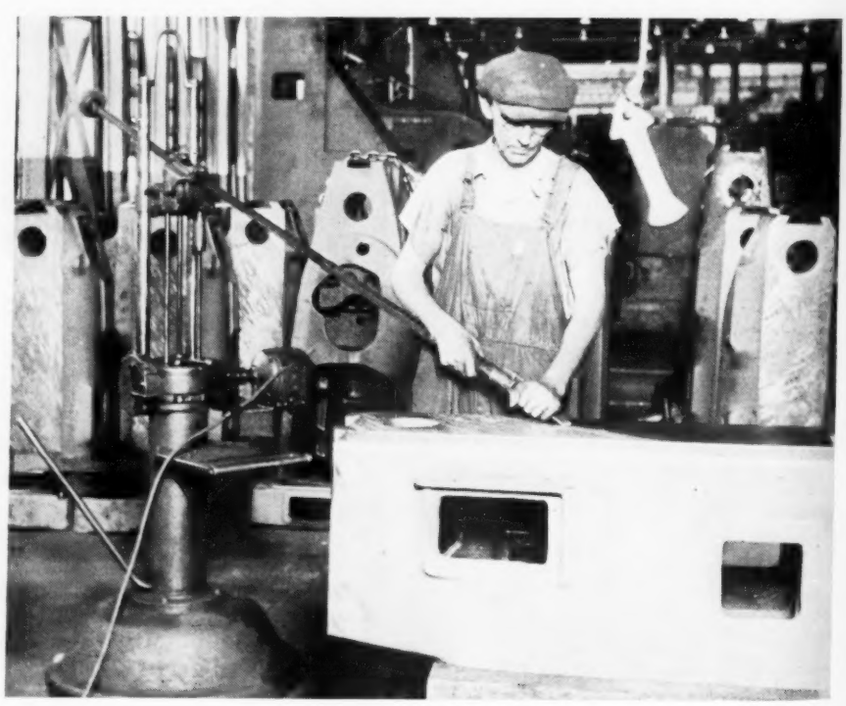


Fig. 1—Semiautomatic rough scraping of milling machine column. Scraping tool makes about 60 strokes a minute

tration will be located from this scraped surface in a large jig where several holes, including the spindle hole, will be bored. Thus it is necessary to provide a true surface for location in this jig and the rough scraping operation solves the problem. Scraping in this case is of a semiautomatic variety, an Anderson scraping machine being used. The scraper is about 1¼ inches wide and 6 inches long and makes approximately 60 strokes a minute. Thus all the operator does is to hold the scraper to the work and guide it. However, the problem is not as simple as it looks inasmuch as he must remove metal only from the high spots to provide a rough locating surface.

The work is spotted up from a surface plate in the regular way using red lead. These surface plates are tested at frequent intervals on master plates and when they show the least signs of wear they are rescraped to true bearings. The company has many master surface plates and

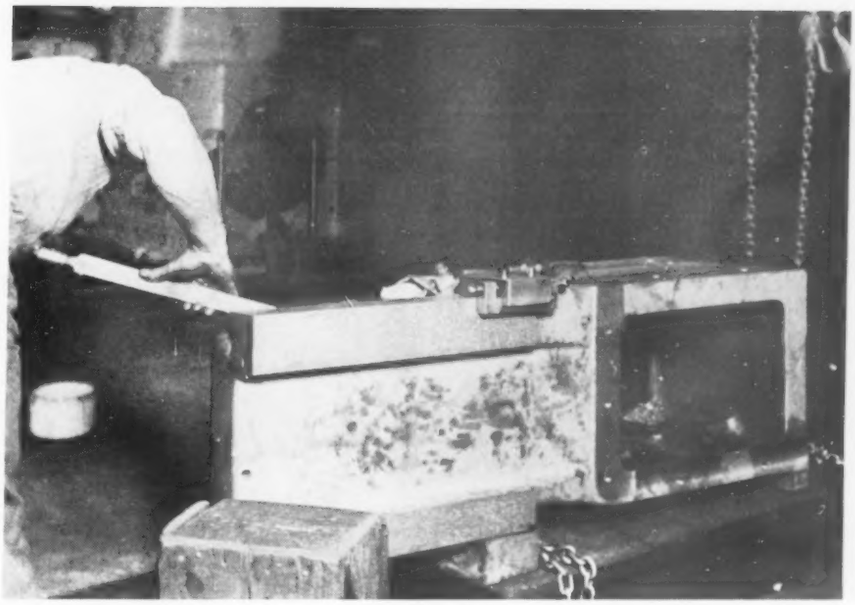


Fig. 3—Parallel surfaces of ways are obtained by careful hand scraping and use of the gage shown at the right end of the way here

Fig. 2 — Finish scraping the ways of a milling machine knee by hand. A true bearing must be made with the table on the hoist in the background

straightedges reserved for testing purposes.

It is of course not necessary to obtain anything like a full bearing in the rough scraping operation since its object is simply to provide the assurance that the work can be located from this surface without cramping. Thus if good bearings are provided at the corners and at intervals between the corners this is all that is necessary. On the other hand if it were attempted to bore these frames without scraping the locating surface, they would be almost sure to cramp when clamped down in the boring jig. When the clamps were released the work would spring back to result in inaccuracy. Such a machine could not pass the final rigid inspection demanded of all the company's products.

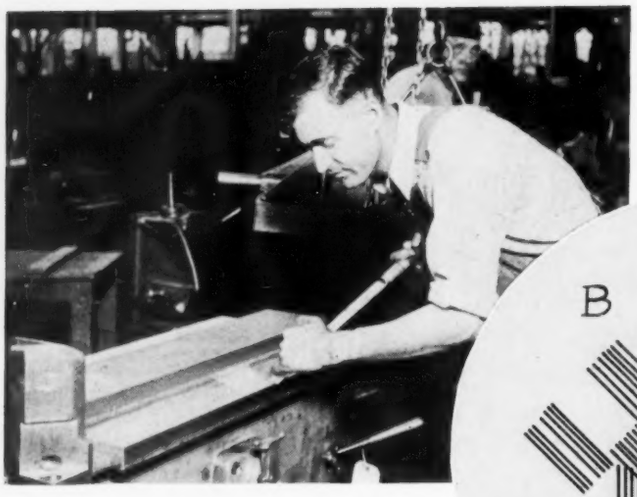
Finish scraping is done by hand, a typical operation being shown in Fig. 2. The machinist is scraping the ways of a milling machine knee which must make a true bearing with the table shown on the chain hoist falling in the background. The principle involved here is to scrape the table to a surface plate and straightedges and to scrape the knee to a true bearing with the table. The operation can of course be reversed and the knee scraped first.

Scrapers used for this work generally are made from old 16-inch files which always are a high grade steel. Thus all that is necessary is to grind away the file teeth and then draw the scraper to a medium straw color. A file as it is originally heat treated generally is too hard to make an effective scraper, since the cutting surface would chip and thus leave objectionable scratches. As Fig. 2 shows, the machinist holds the scraper at an approximate 30-degree angle.

Scraper Grinding Procedure

Great care is necessary in grinding and honing scrapers. Otherwise they will scratch the work instead of cutting smoothly and evenly. Scrapers are ground on fine grit wheels, manufactured alumina about 60 grit, and then finished to the correct edge by honing. The machinist hones the scraper by holding it in a vertical position crosswise on the hone. In this position he moves it back and forth. Thus the finish lines left by the hone run parallel with the stroke of the scraper when it is put to use. The hones can be manufactured alumina in fine grit, a 9 x 2-inch face stone being popular. However, some scraper men prefer the Washita natural silica stone. In honing the stone always is lubricated with oil.

It must be remembered that it is practically impossible to scrape a full 100 per cent bearing, and even if this were possible such a bearing would be dangerous and inefficient in sliding. Two surfaces, perfectly flat with a 100 per cent bearing as exists in accurate gage blocks, would not permit an oil film, or pocket. In other words such a bearing would not "slide." As an example, a grinder bed can be considered. It must be planed to as near a perfect alignment



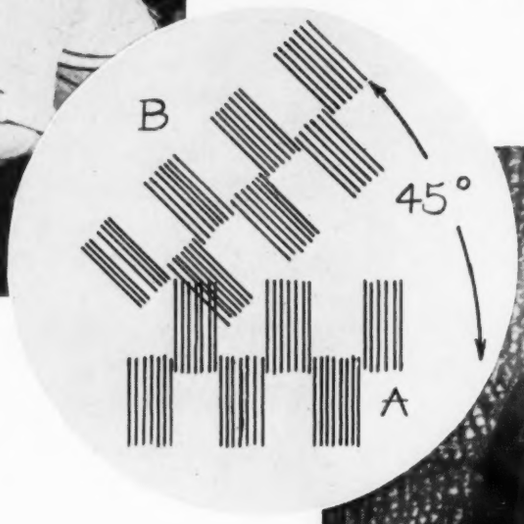


Fig. 4 (left)—First step in ornamental scraping, novel method of decorating exposed surfaces of machines. Fig. 5 (circle)—Sketch showing how decorative effect is obtained by making two series of scraped spots at 45-degree angle to each other

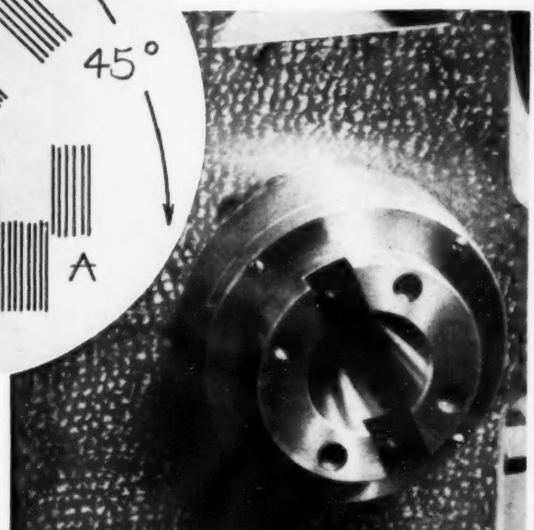


Fig. 6—Light reflection gives this pleasing effect on ornamental scraped surface

as possible, while scraping is for the purpose of removing loose metal only. If the bearing spots wear off, approaching a 100 per cent bearing after the machine has been in use for a number of years, the surfaces must be rescraped to permit efficient lubrication.

At the plant of the Cincinnati Milling Machine the practice is to machine the surfaces as accurately as possible, reducing scraping to a minimum. Certain corrections are made by scraping an at the same time "inaccuracies" or hollows are created purposely for the reason cited above.

Parts Must Be Scraped Together

A scraping operation such as shown in Fig. 2 involves another factor. As this is a dovetail bearing the flat portions at the top and side of the dovetail on the table must fit the corresponding surfaces on the knee. If they are off a fraction of a thousandth of an inch they will not spot up with the red lead used for this purpose. While it is true that this accuracy as regards depth is brought about in the milling operation preceding scraping, it must be carried through when the parts are scraped together. Regarding the V-slides on the knee, it is necessary to scrape one only since the other is supplied with a gib for taking up wear.

Another important factor pertaining to scraping ways is shown in Fig. 3. Here the machinist is scraping the back part of a way to insure that it is absolutely parallel with the front. He tests his work with the gage shown in place at the right end of the way. This gage is adjustable. The operator sets it carefully and when set he should be able to move it from one end of the way to the other. If it binds anywhere along the way, the high section must be scraped down. He is assured of a flat surface at the front as this surface was scraped to a surface plate.

As a surface finished by scraping does not present a uniform appearance, even though it is accurate, all scraped surfaces occupying prominent positions in the finished machines are ornamented. Ornamental scraping is of course entirely a manual operation and the work of different individuals varies just as the handwriting of no two persons is exactly alike. There are many methods used in ornamental scraping, but the following method, employed at the plant in question is simple, pleasing in appearance and low in cost, requiring no special tools.

The first step is shown in Fig. 4. Here the operator is scraping a series of spots which are graphically shown at *A* Fig. 5. The spots are scraped in slightly interlocking lines as shown. Then when the entire surface has been thus covered, the machinist proceeds to scrape series *B* in place. These are at an approximate angle of 45 degrees with those of *A*. The second series crosses the first. The reflection of light brings about the effect shown in Fig. 6. It is difficult to believe that such a simple method can bring about such a pleasing result. Skill is required of course; for example the machinist scrapes each spot shown in Fig. 5 with a single stroke of the scraper pushed from him and he also spaces them entirely by eye. It appears simple on paper and even looks simple when viewed in actuality. However, let the ordinary machinist or toolmaker who never attempted the operation try his hand at it and the result would be pathetic. Long practice is necessary before ornamental scraping can be done neatly and quickly, and a certain amount of artistic ability is essential for a pleasing result.

Since ornamental scraping is applied for appearance sake only we are inclined to ask if it is worthwhile. The finished machine certainly would function every bit as well if its prominent surfaces were not ornamented. However, place two machines of like design, one with ornamental scraping, the other without, on the machinery dealer's warehouse floor or in a booth at a machine tool exhibition and the machine with the scraped surfaces will command many times the attention given to its counterpart with the result that the selling job is greatly simplified.

Exposition Uses 500 Tons of Steel in Miscellaneous Ways

International Nickel Co. Inc., New York, is exhibiting what is probably the most comprehensive display of nickel alloys ever assembled to depict how nickel is playing an important and expanding role in industry and daily life

ALTHOUGH the visitor to the Great Lakes exposition in Cleveland sees steel used in many diversified ways throughout the grounds, he probably does not realize that the tonnage bulks high. Of course, a number of the buildings are of steel construction, such as for example, the Automotive building, the Hall of Progress and the Porcelain Enamel building, but exclusive of steel used in building construction, at least 500 tons is utilized miscellaneously. Only about half of this tonnage is in visible applications, the balance being used underground.

For enclosing the exposition grounds, 31 tons of 7-foot high chain link mesh fence and 65 tons of 8-foot high solid galvanized sheet steel fence was required. These figures include gate posts, gates, corners, ends, and 59,000 feet of 3-strand barbed wire.

Poles for Lights and Flags

A total of 205 light standards of various types, made of steel pipe and channels, and ranging from 16 to 64 feet in height, account for about 50 tons of steel. Forty of these standards in the Midway carry galvanized wire circles on which light bulbs are mounted.

Flag poles to the number of 96 take another 15 tons of steel. These poles are made of steel pipe sections ranging from 7 inches diameter at the bottom to 1½ inches diameter at the top. One pole is 90 feet high, 17 are 60 feet, 30 are 35 feet, 41 are 30 feet and 7 are 18 feet high.

More than 230 tons of steel piping is laid underground. This total is made up of 80,000 feet of standard steel pipe ranging from ½ to 6 inches diameter, aggregating 108 tons; 6800 feet of galvanized pipe ranging from 6 to 10 inches diameter, aggregating 62 tons; and 11,500 feet of merchant casing ranging from 4 to 8 inches diameter, amounting to 60 tons.

Safety stanchions to separate walks from roadways throughout the exposition grounds required 20 tons of steel pipe of 1¼ and 1½ inch diameter. These stanchions, cut to 7-foot length, are set 3 feet in the ground and spaced about 10 feet apart. About 4000 of these stanchions were used. In addition, another quarter ton of steel is utilized in 24 bus station standards. These are made of 1¼-inch pipe and stand 4 feet high.

The exposition grounds is studded with small trees and each tree is braced four ways with 14-gage steel wire with a turnbuckle in each wire for tightening and adjusting. Wire used in this way amounted to three-fourths of a ton and the 2875 turnbuckles represent a quarter of a ton.

To protect grass plots adjacent to walks, the walks are edged with wickets made by cutting steel wire to 36-inch lengths, bending the lengths U-shape and pushing the ends into the ground. These wickets required 2½ tons of 3-gage and 9-gage wire.

Approximately 2½ tons of sheet steel was used in the fabrication of waste boxes distributed through the grounds. About 400 of these boxes are in service and each weighs 12 pounds.

♦ ♦ ♦

OBSERVE IRON AND STEEL DAY

With the exposition approaching its closing days, Thursday Sept. 17, was designated as Iron and Steel day. On that day, officials of the country's major steel companies, and officers and directors of the American Iron and Steel institute, visited the grounds and inspected the Romance of Iron and Steel section.

A report of activities of Iron and Steel day appears in the news section of this issue of STEEL.

Early last week the 3,000,000th visitor passed through the exposition gates. With good weather and attendance holding up well, the closing date has been delayed from Sunday, Oct. 4, to Monday, Oct. 12. Exposition officials appear confident that the goal of 4,000,000 visitors will be attained in the closing days.

♦ ♦ ♦

EARLY HANDIWORK DISPLAYED

Silhouetted along the bottom of three large colored murals which constitute one side of the Romance of Iron and Steel section are some 50 wrought sheet iron figures of metalworking artisans and equipment. These figures, standing approximately 18 inches high, are excellent examples of early handicraft. They were loaned to the exposition by the Rose Iron Works Inc., Cleveland.

♦ ♦ ♦

MUCH PORCELAIN ENAMEL

Setting off its display of kitchen ranges finished in porcelain enamel, the Cleveland Co-Operative Stove Co., Cleveland, utilizes a background of porcelain enamel on steel. All ranges and the several unusually large panels making up the backwall of the booth are made of Armco ingot iron produced by the American Rolling Mill Co., Middletown, O. The panels were fired in one piece in furnaces at the Beaver Falls, Pa., plant of Ingram-Richardson Mfg. Co. Color effect throughout is a combination of brilliant red and white to match red and black trim on the ranges. Powerful batteries of lights, strategically placed, emphasize the smooth porcelain surfaces. To complete the effect, even the circular building column which

arises in the space has been covered with porcelain sheeting. Close at hand is the display of oil-burning heaters, ranges, refrigerators and air conditioning units manufactured by the Perfection Stove Co., Cleveland. Glossy enamel surfaces make these appliances attractive against the exhibit wall of white and green.

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EXPO IS LARGE POWER USER

Electrical current used at the exposition each night is sufficient for the normal use of a city of 10,000 people, the total being nearly 10,000 kilowatts. Power lines enter the grounds at 11,000 volts and go to two substations where the voltage is dropped to 4160 volts. There are no overhead wires or poles on the entire grounds, underground cables carry the current to the various areas where it is to be used and transformer vaults are placed at these points to further drop the voltage to 110 and 230.

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ANCHOR CHAIN PROOF TESTED

Included in the display of malleable iron and cast steel products, including automobile rear axles, railroad car trucks and spun steel car wheels, shown by the National Malleable & Steel Castings Co., Cleveland, are three large cast steel anchor chain links. These links have a cross-sectional diameter of 5 inches and together weigh 1184 pounds. They were triple proof tested to 2,000,000 pounds without reaching the elastic limit.

Two Bibliographies Cover Wire and Galvanizing

Two recently compiled bibliographies now are available in mimeographed form from the technology department of the Carnegie library, Pittsburgh. The copies (while they last) may be obtained free from the department or will be mailed for 25 cents.

The first (68 pages) is entitled "Iron and Steel Wire," compiled by R. H. Phelps of the technology department. References include history, description of plants, equipment, cleaning, coating, lubrication, dies, heat treatment, effect of temperature and testing of wire.

The second bibliography (110 pages) is entitled, "Zinc Coating (Hot Galvanizing)" compiled by V. S. Polansky of the technology department. References include history and development, galvanizing procedure, equipment and fuels, effects of galvanizing, tests of coatings, corrosion and corrosion resistance, galvanized products, welding, specifications, galvanizing plants, by-products and their recovery, United States and British patents.

Properties of Nickel Alloy Steels Are Summarized

Properties and applications of heat treated wrought nickel alloy steels in sections up to about 6 inches in diameter or thickness are reviewed in bulletin P-1 recently published by the International Nickel Co. Inc., New York. With illustrations and charts to amplify the text, the 14-page booklet includes discussion of two general classes of nickel steels —the carburizing steels, containing up to about 0.25 per cent carbon, which are used where a hard, wear resistant surface is required together with maximum toughness or resistance to shock; and the oil and water hardening steels, containing from about 0.25 to 0.50 per cent carbon, which are uniform in carbon content throughout and frequently are used where machining is done after heat treatment to provide smooth, bright, scale free surfaces.

Second Report on Stress Distribution Published

Co-operating with the national bureau of standards, American Institute of Steel Construction, New York, has recently published progress report No. 2 on stress distribution in rigid steel frames. This report gives the results of the tensile tests for the coupons for the rigid frame No. 1 fabricated by the Bethlehem Steel Co., Bethlehem, Pa., and also the stress distribution near the knee of this frame after the corner gusset plates had been removed.

Chemical Society Speaker Incorrectly Identified

In connection with a report of proceedings at the ninety-second meeting of the American Chemical society in Pittsburgh, Sept. 7-11 (STEEL, Sept. 14, p. 67), reference was made to a paper presented by B. D. Saklatwalla, president of the United States Rustless Steel & Iron Corp., Gulf building, Pittsburgh. Dr. Saklatwalla was incorrectly identified with the Rustless Iron Corp.

Inasmuch as at no time has Dr. Saklatwalla been associated with the latter concern, STEEL takes this opportunity to rectify the error and to give Dr. Saklatwalla's correct affiliation.

Portable Laboratory Solves Lubrication Problems

AID in solution of machinery lubrication problems is brought to California engineers by the portable laboratory shown in the illustration. Sponsored by the Standard Oil Co., this mobile unit carries for demonstration purposes all types of bearings connected with motors and meters to permit a direct observance of the physical laws applying to the lubrication of machinery. By varying the operating conditions of the bearing under consideration, correct bearing design features to give the best results may be shown. Photo courtesy Westinghouse Electric & Mfg. Co.

MATERIALS HANDLING

Lands Big Equipment Order Through Ability To Handle It in the Shop

WALKING home the other evening from the station, the writer had as a companion a member of the staff of a nationally-recognized firm of consulting engineers. Having been neighbors for several years, there is more than passing acquaintanceship with some of the everyday business activities of one another. During the years 1931 to 1935, the aforementioned firm of engineers did not have a single industrial project of any size worth mentioning. The majority of its draftsmen and engineers was forced out of employment. The turn came in 1936 with a contract for the largest mill unit that has been constructed within a certain large industry for several years.

This may seem a rather far-fetched introduction to an article relating to materials handling, but it was the discussion of the change in business status that led to talk about the new mill project and eventually to the following anecdote.

No Competition for Order

In connection with the letting of the contracts for equipment for this large mill, materials handling proved one of the determining factors in the award. It appeared that two manufacturers had the inside track position, but when the time for receipt of bids arrived, one dropped out of the race entirely. Within the past week a representative of this latter manufacturer told the consulting engineer's man why he had been unable to put up a fight for the business.

In studying the specifications and shipping requirements for certain of the large items of equipment, it was discovered at the last minute that, were the order obtained, the contract could not be carried out without great loss. The reason? There was no way that they could handle the finished products out of their plant yard after the fabrication had been completed.

Plant Facilities Inadequate

According to this consulting engineer, the ability of one manufacturer to carry through not only in efficient materials handling in the production, but also in the shipping department, determined success or failure in obtaining a very large order. In the one instance, the manufacturer found himself faced with a problem similar to that of the man who built a large boat in his basement, and then found he had to dismantle either it or the basement wall to get it out of his workshop. In the other, the materials handling system had carried through the shipping department as well as through receiving and production.

This incident, while it may seem an unusual and far-fetched example of materials handling as a factor in business, is in reality typical of what is transpiring in many industries today. Designs change rapidly. Frequently, change of designs means rearrangement of manufacturing departments, relocation of machine tools or other major machinery, and a departure from many previous production methods. In such instances, flexibility of the materials handling system is an important factor in determining its usefulness under the new set-up.

Progress Is Watched

Concerning the particular case described by the consultant, the latter made this remark: "We as consulting engineers follow closely all progress in the art of manufacture. Often this intimate acquaintance leads to the design of new equipment to permit practical use of the discoveries of the technical experts. It was a new process of elimination of certain waste in the industry that resulted in the design of the large size equipment. Because one manufacturer's facilities were flexible enough to handle this new and larger size, he obtained some very desirable business."

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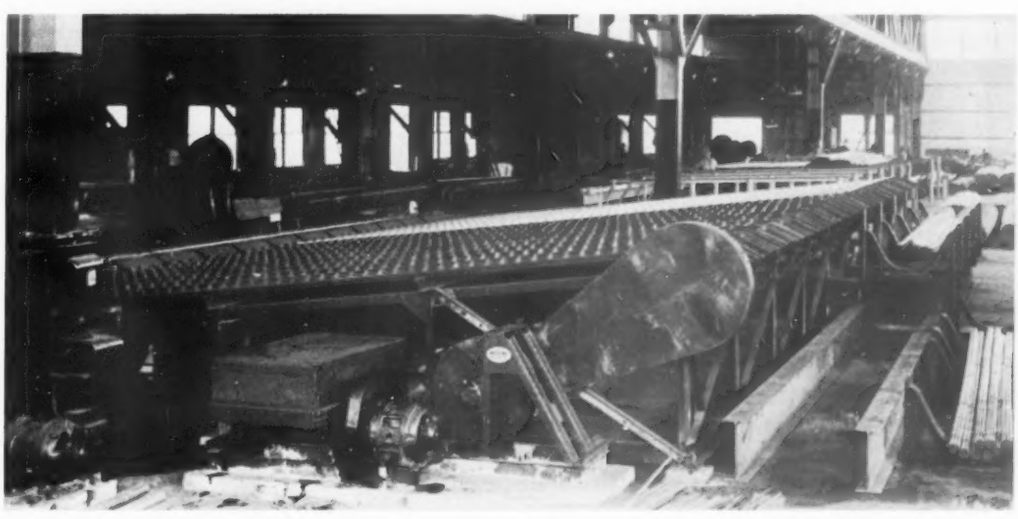
Trucks Under Rigid Control

IN A large metalworking plant, where a carefully planned distribution of materials has been in successful operation for a long time, locations for drop deliveries have been designated for each section of each department. Truckers are permitted no discretion in depositing their



CLOSE-UP view of variable-speed transmission controlling the surface speed of a cooling table and synchronizing it with speed of runout tables—a typical use of modern control methods in conjunction with materials handling equipment. Photo courtesy Mathews Conveyer Co.

loads, even when a foreman in an adjacent department insists that the truck load be dropped at some other than the designated point. Long and thorough study has convinced the management that the storage depots throughout the plant are located in each instance at a distance from all machines served by that depot which provides the maximum economy of travel over any day's operations.

In this same plant, located in a multistory building, each floor has a truck storage area to which, at the conclusion of each day's work, each trucker must return his truck whether it be a hand truck or a powered unit. The trucks are locked to a chain and the foreman of the department has charge of the key. Before the system was put into use, it was a common occurrence for a trucker to spend 20 minutes or more in the morning locating the truck which he had dropped somewhere around the plant at closing time the previous night.

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Accessories for Handling

ADVANCES of the past few years in materials handling methods have been characterized not so much by new types of handling equipment, as by adaptation of existing types to new jobs to be done. In other words, there has been more refinement of equipment than invention of entirely new machines. Thus, continuous conveyors have added a wide variety of hooks, baskets and other devices for safe and efficient suspension of loads. Roller conveyors have added refinements in control and special deflecting devices, as well as other built-in accessories.

Likewise, various lift-trucks have added crane attachments, telescoping arrangements and other accessories to make them more suitable for a wider range of applications. Monorail manufacturers in many instances have added automatic pick-up and release features. Cranes are now commonly furnished with crane scales attached. So it is all up and down the line of equipment.

One of the latest of these accessories that has come to our attention is a special handling hook designed for safe handling of coils of strip steel. This device is shown in accompanying illustrations. In operation, the hook is attached to the crane. The craneman drops the hook, locked in its extended or open position, and lets it come to rest on the top of the coil. He then lifts the latch and as the shackle is lifted, engaging hooks are drawn into contact with the ends of the coil and the latter is readily raised. These hooks have a range for coils 22 to 80 inches wide and up to 10 tons in weight.

Until recently portable elevators were generally standard lifting and stacking devices which simplified the task of high piling and neat storage of barrels, boxes, bales, skids and other containers. Today a wide variety of special accessories has made these elevators useful in many directions. For example, one such machine is equipped with a turntable platform which makes it particularly useful for handling drums. Another is equipped with reversible and removable rollers 28 inches long, 3½ inches wide and with a height of 2 inches to the top of the rollers.

In some plants recently the necessity for utilizing stackers in different departments separated by low clearance doorways has brought about the use of a hydraulic raising and lowering device, which allows one man to lower the upper section of a portable elevator, this section being hinged to the lower one. One manufacturer has added to his elevator an auxiliary crane which may be hinged back when desirable. Sliding roller platforms, kettle and drum dumpers, and ladder attachments for easy access to operator's platform are but a few of the many special devices that are now becoming common in industrial plants.

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Automatic Pickup

THE addition of automatic pickup and discharge to the other facilities of industrial trucks is looked upon by many as adding the final measure of value to this type of materials handling equipment. In attaining this, several varieties of accessories have been combined with the truck. These range all the way from forks and rams to crane and magnet attachments and in one of the most recent adaptations to a roller conveyor attached to the truck platform. It has become apparent that ingenuity among truck manufacturers produces a special machine for almost any unusual handling job.

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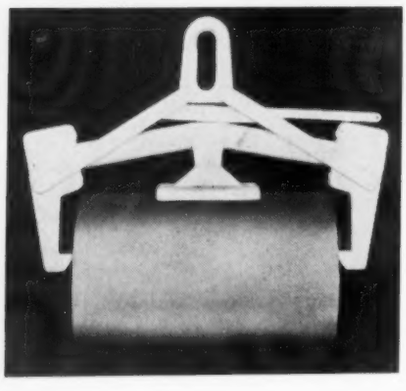
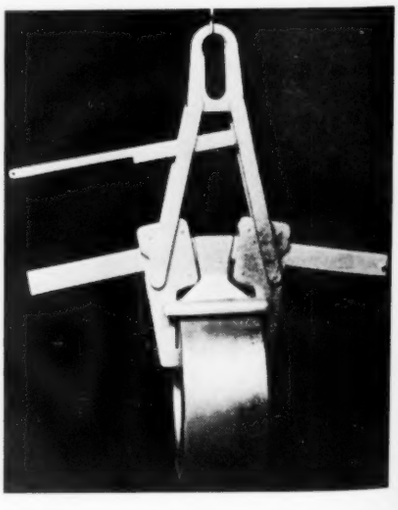
Handling Division Revived

MATERIALS handling division of the American Society of Mechanical Engineers is renewing its activity. There is indication that 1937 will witness a program of papers and plant visitations similar to those which proved so popular during the predepression era. There is a likelihood of a session in Detroit next spring with a probability that some of these recent achievements of the automotive industry will be the basis for much of the program.

In the meantime, the division is





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NEW type hook for handling coils of strip steel. As shown at the left, the supporting member has come to rest on top of the coil. When the latch is lifted by the crane operator, as shown at the right, the engaging arms are drawn into contact with the coil ready for lifting. Photo courtesy United Engineering & Foundry Co.

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Truck illustrated made by The Yale & Towne Manufacturing Co.

EXIDE-IRONCLAD BATTERIES help to quicken the pace of production . . .

THE quick efficient handling of materials need not present a problem. Electric industrial trucks of the type adapted to the requirements offer good speed, almost unlimited power, and dependable, uninterrupted service when Exide-Ironclad Batteries are used.

By furnishing ample power for unusual loads and grades, combined with sustained voltage that means productive speeds throughout each working shift, Exide-Ironclads speed up production and cut costs.

These batteries require a minimum of attention, being dependable, trouble-free and long-lasting. That is why they keep maintenance costs down. Write for new, free booklet, "The Efficient, Economical Method of Handling Material."

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THE ELECTRIC STORAGE BATTERY CO., Philadelphia
The World's Largest Manufacturers of Storage Batteries for Every Purpose
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MATERIALS HANDLING

sponsoring only one meeting. That will be held Dec. 3 during the annual meeting of the society in New York. The general subject will be "Coal Handling". Three papers will be presented. George Arms, Jeffrey Mfg. Co., Columbus, O., will describe "The Baum System of Coal Preparation". Thomas Fraser, coal preparation engineer, Stephens-Adamson Mfg. Co., Aurora, Ill., will present a paper on "Coal Preparation by the Air Sand Process". John Griffen, Koppers-Rheolaveur Co., Pittsburgh, will discuss his company's system of coal cleaning and show motion pictures of a separation unit.

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Selecting Suitable Drives

INQUIRY among manufacturers of motors and controls reveals that very little information is available as to where the majority of such items is being used with materials handling equipment. The reason for this is that most such drives are sold to or through the manufacturers of the conveyors, cranes, hoists and other devices. In the case of conveyors, each installation is ordinarily a special engineering task.

Conditions surrounding the layout of the factory in which the equipment is to be installed, peculiarities of the product or products to be conveyed, time elements in the processing or assembling operations, weights and dimensions of both parts and finished units, all enter into the selection of the drive.

An insight into this problem of drive selection is accorded by data recently made public by Mechanical Handling Systems Inc. First, before a suitable drive can be selected, the maximum chain pull must be computed. This pull, we are told, is a function of the total moving load and the combined friction of the trolleys and turns, either horizontal or vertical. Here is one method for determining the pull:

(1) The chain pull from rolling friction equals total maximum moving load X 3 per cent.

(2) The chain pull from change in elevation, as when going from one floor to another equals vertical distance from low to high point on the conveyor multiplied by the maximum weight per foot of moving load.

(3) For total chain pull add friction load from (1) to vertical lift load from (2).

Horsepower at head shaft equals chain pull in pounds times maximum speed in feet per minute divided by 33,000. To this add 15 per cent for horsepower through drive.

Here is a typical example: A conveyor length is to be 500 feet. Trolley and carrier at 2-foot centers equal 50 pounds; applied load per carrier is 200 pounds; the maximum loading is up to 75 per cent of the conveyor length. There is a 12-foot vertical loaded rise to the second floor of the factory. Conditions call for a speed of 30 feet per minute. The problem is to find the maximum chain pull and the horsepower required for the drive.

The procedure is as follows: Weight of trolleys and carriers equals length of conveyor times weight of trolley and carrier at the centers given divided by 2. In this instance, it is found that 500 X 50 divided by 2 is 12,500 pounds. The weight of the maximum applied load equals the maximum loading percentage multiplied by the length of the conveyor and by the applied load per carrier, divided by 2, which gives 0.75 X 500 X 200 divided by 2, or 37,500 pounds.

The weight of chain is the length of the conveyor multiplied by 3.125 which gives 1563 pounds. Total maximum moving load is the sum of the foregoing three items, or 51,563 pounds. Chain pull due to rolling friction equals the maximum moving load multiplied by 0.03 or 1547 pounds. Chain pull due to vertical rise equals applied load per carrier times the vertical loaded rise divided by 2, or 200 X 12 divided by 2 equals 1200 pounds. Then the maximum chain pull equals the sum of the last two items, or 2747 pounds.

Horsepower at motor equals 2747 X 30 divided by 33,000, multiplied by 1.15, or 2.87. Thus, it is determined that the answer to such a problem is 3 horsepower.

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Photoelectric Control

IN ONE of the large steel plants, a dial scale equipped with photoelectric control is connected by levers to a coke hopper. The feeder motor of the latter is arranged so that it is shut off automatically when the desired amount of coke has been fed into the hopper. This automatic operation is provided by the interception of a light beam.

INDICATIVE of the part which materials handling equipment plays in heavy industrial work is this electric traveling crane recently installed for Moore Dry Dock Co. at Oakland, Calif. It is working on the assembly of approach trusses for the Golden Gate bridge. This crane is equipped with herringbone gears and roller bearings. It has a capacity of 20 tons and has a 7½-ton auxiliary hoist. The span is 80 feet. Photo courtesy Whiting Corp.

A Suggestion for a Conference

Submitted by

TRUSCON

EXPLANATION: Keen competition and rising costs call for thorough investigation of counteracting forces. For example, the pressed steel process provides exceptional opportunities for improving product design, increasing saleability and reducing costs. This suggests the following subject for discussion by your sales and production executives:

SUBJECT: What advantages of pressed steel can we utilize to help us improve our competitive position and increase our profits?

Suggested Procedure: Set a date for a thorough discussion of this subject. Call in a Truscon sales-engineer to answer questions. This service will not obligate you and is gratis.

Possible Results: You may discover many practical ways of using pressed steel parts or widening your present use of this process.

Truscon Facilities: If you do discover new opportunities for improvement through the use or greater use of pressed steel parts, Truscon's 13 acres of concentrated pressed steel facilities make it possible for you to secure *all* the advantages of pressed steel without *any* capital investment on your part.

Truscon's Pressed Steel Services are 100% complete . . . sales-engineering . . . production engineering . . . tool and die-making . . . metallurgical and testing laboratories . . . presses up to 2500 tons capacities . . . modern materials handling methods . . . complete inspection service . . . experienced traffic and shipping departments.

Consider this subject of pressed steel. Truscon can assist you because Truscon is completely qualified.

TRUSCON STEEL COMPANY

PRESSED STEEL DIVISION

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IF IT'S MADE OF PRESSED STEEL — TRUSCON CAN MAKE IT!

Rapid Development of Synthetics Fosters Changes in Spray Cap Design

SYNTHETIC materials have numerous characteristics quite different from lacquer. They are more viscous and slower in drying than lacquers. They produce a high gloss and are tougher than lacquer, and dry more rapidly than the old style enamels.

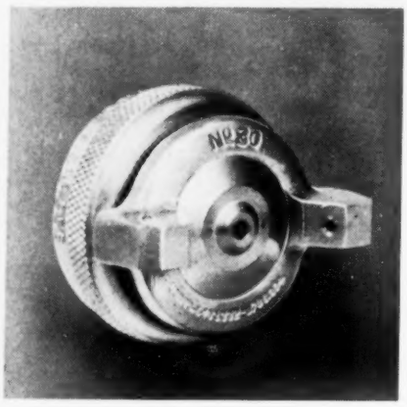
Both synthetics and lacquers are wet when applied to the finished surface. Lacquers dry almost immediately after spraying, while a longer interval is required for synthetic materials to dry. Consequently synthetics have a greater tendency than lacquers to run or sag.

Due to the nature of synthetics, it is necessary first to apply a light coat, a little heavier than a mist coat. Then, after an interval, a heavier coat is sprayed on. Consequently higher air pressures are needed to break up and properly atomize the synthetics, than are required for lacquers.

Spray Patterns Improved

The high gloss of synthetic materials accentuates any surface or undercoat defects, which necessitates fine, even, full bodied application of both undercoats and finish coat. Synthetics, therefore, must be applied with spray guns that will finely atomize the material and apply it to the surface with uniform smoothness, and in such manner as to avoid runs and sags. The development of synthetics consequently changed spraying conditions and requirements, because spray equipment designed for the application of lacquer was generally not satisfactory for use with synthetics. Progressive spray equipment manufacturers met the problem by improving the general quality of equipment, producing new spray guns with improved atomization, improved spray patterns, improved adjustments, easier handling and manipulation, and improved and more fool-proof design.

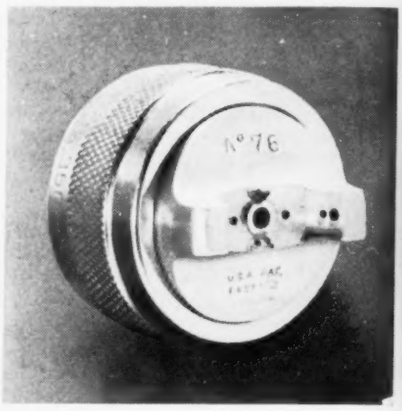
Older type air cap used extensively for suction feed application of lacquer and similar materials. Under certain conditions it was also suitable for use with gravity or pressure feed. It was designed for use with atomizing air pressures not to exceed 60 pounds. Had only two air ports, one in each horn



Later type cap designed for suction or gravity feed application of synthetic materials and lacquer. Designed for use with atomizing air pressures of 50 pounds and higher. In addition to air port in each horn, it has two small auxiliary ports or jets close to the center orifice. It is suitable for use for both light and heavy-bodied materials where split sprays are not troublesome, but atomization is difficult

The newer types of spray guns are designed to spray modern finishing materials with greater efficiency, producing higher quality finishes with less effort and at lower cost. They are universal spray guns. With proper nozzle combinations they may be used with any sprayable material. Larger air passages in the new spray guns permit a greater volume of air to be brought up to the spray head, or working end of the gun. There is less air pressure drop through the gun, and the proportion of air to material flow is increased.

Spray heads have large port openings and a baffle arrangement which insures uniform distribution of air to the horns and center orifice of the air cap. This results in uniform atomization of material and a balanced uniform spray pattern.



This pressure feed multiple jet air cap is intended for high production use with heavy-bodied lacquers, primers and synthetics. In addition to two ports in each horn, it has four auxiliary atomizing jets near the center orifice. While it will handle ordinary light-bodied materials, it is not recommended for them. It is very fast and will handle a considerable amount of material

Multiple Jets Introduced

Working conditions, products, surfaces and materials vary considerably and require the proper combination of air cap and fluid nozzle for maximum efficiency and highest quality finish. New style air caps have four or more air ports for synthetics, while the old style such as used for lacquer has only two air ports. Spray heads are supplied by the spray equipment manufacturer with the particular air cap and nozzle combination recommended for the kind of work being done, for the particular material feed in use and the speed of production required.

The improved multiple jet air caps produce better atomization, better spray patterns and more uniform

Chromium Plating

SAVES ALL ALONG THE LINE

Production Machinery . . . Tools . . . Products

THROUGHOUT scores of plants, chromium plating is now used as standard practice in the battle against costly wear and corrosion.

Feed screws, spindles, cams, shafts, pump rams and pistons, gear grinder racks . . . these and many other machinery parts are chromium plated for longer life, to cut down maintenance expense, to reduce breakdown and "time-out" delays.

Drills, taps, reamers, milling cutters, drawing dies, plastic molds? Yes, these are merely a few of the tools which are regularly chromium plated to foil Father Time.

And as for the products . . . they range from shirt studs to ¼ ton locomotive main rods!

Look into the many proved opportunities to save and to improve through the use of chromium plating. We would be very glad to cooperate. We would be glad, too, to tell you about our Licensing Arrangement, which makes available the chromium plating process and a valuable engineering service.

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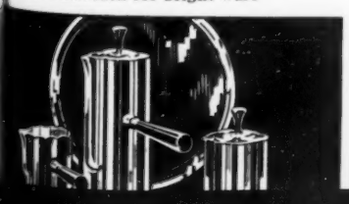
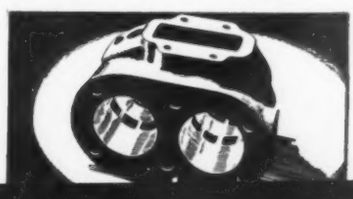
Chromium Plating . . . the modern finish for bright ware



Machinery parts are protected against wear and corrosion



Life of molds, dies, tools greatly increased by chromium plating

Wide variety of products made better-looking, more durable

application of material. They provide greater air volume, prevent split sprays at higher pressures, and produce even application instead of a heavy center type of pattern. The small nozzle size and consequent reduction of material flow saves material, provides greater air volume in proportion to material flow and prevents sags or runs.

Air Equipment Vital

Next in importance to the spray gun in producing high quality finishes is the air transformer. This equipment regulates the air pressure and allows only clean dry air to reach the spray gun, thus protecting the finish from defects. The compressing unit must be of sufficient size (in cubic feet of air per minute) to keep the spray gun in continuous operation at the desired pressure. Maximum efficiency, speed and quality of finish cannot be expected of any spray gun unless the air compressing equipment constantly delivers the volume of air consumed by the air cap. The compressing unit must be capable of efficient and trouble-free service. There is costly waste in the use of old, worn or obsolete compressing units, or in the continued use of out-of-date, inefficient spray guns. Such losses far exceed the cost of new, modern, improved equipment.

The diameter and length of the air hose used has a marked effect upon the efficient performance of a spray gun and the quality of finish it produces. Too often the spray gun is blamed for functioning improperly when the real cause is an inadequate supply of compressed air. Even considering the enlarged air passages in modern spray guns, this improvement is too frequently offset by the use of improper size air hose.

Vitreous Enamel Applied to Copper

ENAMELED copper is a new engineering and architectural material. Several types of vitreous enamels especially adapted for use with copper have been developed recently at Battelle Memorial institute, Columbus, O., as the result of a research program sponsored by the Copper and Brass Research association.

Unusual Effects Obtained

A thin, clear enamel which has been given the name "Crystal-cote" is used primarily to protect copper from tarnish and to maintain the original color and appearance of the metal. This enamel can be modified to obtain many beautiful and distinctive color effects due in part to the combination of the copper surface with the enamel. A heavier enamel which is dense and opaque is used on copper to extend the application of enameled surfaces. This type of enameled copper is used to meet unusually severe conditions such as are met with in tunnel linings, basement partitions or decorative panels exposed to the weather. Even if the enamel chips at the corners so that the base metal is exposed no rust is formed and unsightly blotches or streaks are avoided.

The enamels that have been developed are designed for use with copper. Adherence, resistance to temperature changes, physical strength, resistance to tarnish, weathering and salt spray have been worked out carefully and tested repeatedly. The thickness of the applied coating is about 0.003-inch. The coating is flexible so that coated copper can be distorted considerably before cracking results. An appreciable distortion in compression is required to break the enamel.

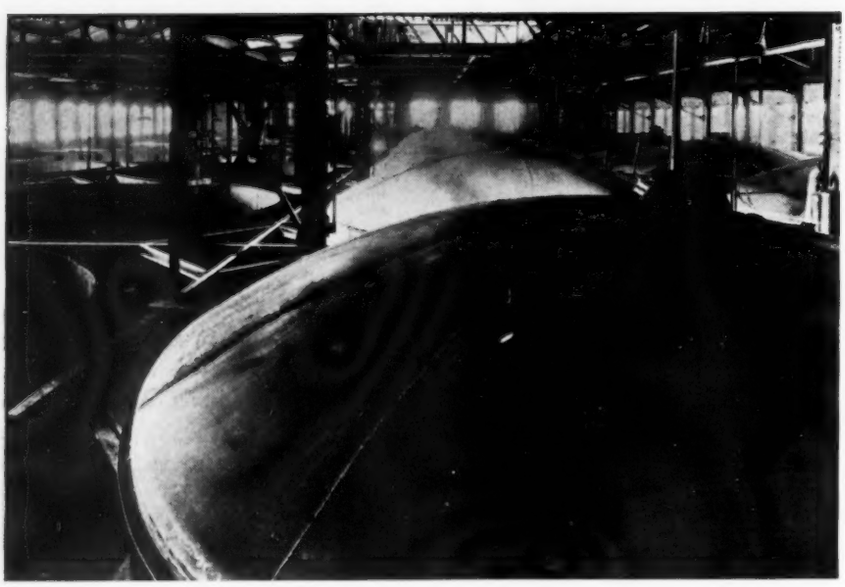
Colors Regulated by Firing

The thin layer of transparent enamel does not hide the metal. Many striking effects can be obtained by the use of different mill finishes on the copper. Beautiful combinations of natural copper, red, black and even gold shades can be produced by careful regulation of the amount of air that is in contact with the copper during the firing cycle.

Various color effects may also be obtained by addition of metallic salts either in the smelter or at the mill. Transparent and translucent colored enamels result. The colors produced are specific to copper and are not the same as those obtained either by opaque enamels or by the same enamels on other metals. The opaque enamels that are used for copper can be furnished in the complete range of colors available for enameling steel.

Enameled copper is somewhat more expensive than enameled steel, and it is not so stiff or rigid, as the enameling temperatures are above the annealing point of copper. It has marked advantages for certain applications, however, and enameled copper offers unusual color effects and combinations.

Alcohol Resistant Enamels Protect Steel Vats



OVER 2000 tons of steel plates were employed in the construction of these 24 fermenting tanks at the distillery of Hiram Walker & Sons Inc., Peoria, Ill. To protect these tanks, each of which has a capacity of 120,000 gallons, they were first painted with a coat of special lead chromate primer, followed by a synthetic gray enamel specially formulated to resist alcohol. This distillery, said to be the largest in the world, has a daily capacity of 25,000 gallons of alcoholic spirits. Photo courtesy Sherwin-Williams Co., Cleveland

Paint in Stick Form Used To Mark Hot or Cold Metal

Paint in stick form for marking metal surfaces is now being supplied by Helmer & Staley Co., 2489 South Park Way, Chicago. It is furnished in two types—one for marking cold surfaces, such as wood, stone, metal, glass and the like; and the other for hot metals up to 1200 degrees Fahr. A metal holder of thin, flexible steel, which permits the maximum use of the stick, is furnished in each package of a dozen.

WELDING, etc.—by Robert E. Kinkead

Need New Process for Welding Thin-Gage Steel

STRIP steel for which a mill receives about $60 per ton in the cold-finished condition becomes worth $400 to $800 per ton after fabrication. That spread focuses interest on welding processes, since some type of welding usually is used to fasten individual strip details into a useful assembly such as an automobile, a refrigerator or a kitchen sink.

Flash, spot, projection, gas, arc and atomic hydrogen processes are used for welding strip steel. Much remains to be done in the direction of making straight butt welds in strip at lower cost. The problem may be illustrated simply by the case in which the edges of two 20-gage pieces of strip steel 36 inches long are to be welded together. Flash welding requires a heavy capital investment although the weld is excellent. Any of the known fusion welding processes may be applied at a small capital investment but the difficulties with warping and in finishing the weld are overwhelming in many cases.

Lapping the joint and spot welding is an expedient often adopted because we have not as yet solved the problem of how to make a more satisfactory butt weld in thin-gage material. A lapped joint is objectionable on every ground on which a mechanical fastening may be criticized.

A better process of making butt welds in thin gage steel is needed.

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Better Mousetrap Builder Wanted by Welding Trades

ELIHU THOMSON'S resistance welding process has lived and prospered for 50 years. The grand old man himself has lived to see the whole technical world bow in homage to his genius. Steel automobile bodies, refrigerators, aircraft and hundreds of the products of industry are made better and at less cost because of the efficiency of the process Thomson invented and developed. Elihu Thomson laboratory of the General Electric Co. at Lynn, Mass., is a monument to the genius of the man.

When the basic principles of the Thomson process are superseded by new discoveries, as they inevitably must be, the spirit of Elihu Thomson will be the first to acclaim the advent of the change. The direction from which the discoveries will come is not yet clear.

But regardless of the direction from which the new ideas come, we can specify now what it will take to supersede the Thomson process plus the improvements of men who have built on the foundations Elihu Thomson laid with such thoroughness. The process must be independent of surface conditions of the metals joined; no more pressure required than is necessary to hold the metals together; less power demand load on the central station; the apparatus and machinery required must be more universally applicable than that used at present.

The chances are about a million to one that the superseding idea will come from anyone who does not have a vested interest in spot, flash, or resistance butt welding at the present time. The chances are about one in two that the idea will come from a man of electrical experience with no background of welding knowledge. There is about the same probability that the idea will come from a man who is primarily a production expert but has a background of welding experience.

Ralph Waldo Emerson's classic parable of having a path beaten to the door of the builder of a better mousetrap would be far exceeded for the man who can devise this better welding process. Manufacturers in Detroit and Cleveland will build him a four-lane highway lined with orchids.

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Inventions

AMONG the activities suggested for the proposed professional division of the American Welding society is that of encouragement of inventions relating to welding. Such activity would contribute greatly to the progress of industry at large.

A review of progress in welding in the last 50 years indicates that not more than half the inventions upon which the great prosperity of the welding industry rests were made by men who were engaged in any kind of welding activity. A conspicuous example is that of Elihu Thompson, the greatest of them all, who was an electrical engineer who invented the process which bears his name. He was not involved in welding operations of any kind other than for the purpose of perfecting his invention.

The professional engineers of the American Welding society might consider inventions solely on their merits rather than on the basis of their source, and see to it that promising ideas are brought to the attention of interested parties. Few companies can completely satisfy their needs for new ideas solely from their own research laboratories. Marvelously productive as commercial research may be, it has not captured the inventive spark that may create a new industry over night. Granting that shoe clerks and barbers are not likely to produce welding inventions, there are many electrical, mechanical, chemical, metallurgical and other specialists who might apply their knowledge to welding problems. Intelligent self interest requires that the best brains in the world be focused on welding developments.

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Wages for Welders

WHAT wages are being paid welders? That question is one of the most frequent we hear. The answer is never satisfactory. Welders wages run from 50 cents to $1.60 per hour. This means exactly nothing unless the continuity of employment is also stated. The man's family expenses go on 365¼ days per year. We have seen many cases on railroads and in the steel industry where 70 cents per hour was better in the long run than $1.25 per hour with frequent layoff periods.

It is good business to pay welders well. Welders who have skill and judgment cost too much to lose to someone else who will pay them more money. If welders cannot be paid well, management is not taking full advantage of what is known about welding. Thanks to the general enlightenment of American industry, we have served professionally more than 60 clients and have never yet been asked to show one how to reduce welder's wages. But many have paid us good money to find out how they could pay their welding operators more money. The most tragic experience we ever had in this connection was to hear a union agent arguing his case for a 2-cents-per-hour increase for his men when we had been paid by management to show how to pay the men at least 10 cents more per hour.

The worst and most expensive welding is done by the lowest paid operators. That statement is the result of 23 years of experience with welding in this country.

POWER DRIVES

Independent vs. Group Maintenance Costs

WHETHER maintenance and servicing of group drives cost more than for a corresponding unit drive installation of the same machines is a debatable point. Some plant managers hold one opinion and some the other. And in many cases each can cite definite experiences on which he bases his opinion.

A factor often overlooked in comparing such costs is that the maintenance of group drives is largely mechanical, and of individual drives electrical. There the work and expense is shifted from one type of man and department to another. Where these departments are under different supervision both department heads may gain an erroneous impression.

Also, in many plants the electrical servicing is performed by a higher grade man than used on mechanical maintenance and servicing, thus partially compensating for the increase in work but at the same time giving better attention and so keeping the cost of such work and interruptions at a minimum. Many plant men still believe oiling is an unskilled labor job.

Maintenance and servicing expense on power drives is determined by the operating conditions; the type of bearings, motors and control installed; the quality and adequacy of lubricants, and the intelligence of the service man. Operating conditions and type of equipment determine the amount of such work which should be necessary; lubricants used and intelligence applied are usually responsible for exceeding or reducing this amount.

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Compressor Power Losses

A READER has called attention to an omission of one of the important sources of power waste in compressor drives mentioned in an item in this department in the Aug. 31 issue of STEEL. This waste often occurs in the connection or drive from the motor to the compressor.

Because of the shock or pulsations of the compressor load, open belt drives must be operated excessively tight to maintain the necessary tension or some device used automatically to maintain this tension. The losses from this source are difficult to determine as the only measurable indications of such losses show up in excessive wear and servicing of the belt or in the short life of a burned belt.

Idler drives have been used for years to increase the belt wrap on the smaller driving pulley and also to take up tension at the pulsating periods. More recently the development of the pivoted motor base, which automaticlly maintains tension by "digging" into the load at the pulsation periods, has led to its wide and satisfactory adoption on belted compressor drives. The pivoted motor base also eliminates the adoption of flexure or bending of the belt around the idler and tends to increase belt life.

Silent chain and V-belt drives also eliminate the power losses of slippage on compressor drives. For satisfactory life of any type of drive sufficient additional rated drive capacity must be added to the motors and belts or chains to absorb this shock or pulsation.

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Overload Protection

ONE advantage of electrical equipment is the ease and accuracy with which it may be protected against overloads. However, when the protective device operates too frequently the entire drive installation (motor, control, wiring and the machine or equipment driven) should be carefully checked to determine the reason before increasing the size of the motor or the amount of protection.

To increase the protection only, without determining the reason, is like putting a penny or nail in the fuse box to be sure it doesn't blow again. Where machines have been added or the work load increased a larger motor or increased overload capacity, within safe limits, are the only solutions.

However, where no changes have been made in machines or load, trouble usually indicates something has gone wrong in the machine. Any of a number of improper conditions may be the reason. Misalignment due to loosened fastenings is a common cause. Worn or broken gear teeth, worn or improperly fitted bearings, inadequate or improper lubrication, or improper feeding of the material to the machine are only a few of the conditions which may be found at fault.

Where the trouble is difficult to locate, testing out with recording ammeters will often help determine the cause as in many cases such faults occur in cycles instead of being continuous.

Increasing the motor or overload protection under any of these conditions would be a mistake and likely to result eventually in serious damage. Removing the cause is the only safe step. Overload protection is supplied merely to guard against damage under such conditions and unavoidable sudden stoppages.

Where sudden stoppages cannot be prevented many plant enginers are adopting fuseless overload protection because of the ease and quickness of putting the equipment back into service as soon as the cause of the stoppage is removed. With such protection it is not necessary to call for an electrician, thus saving about 15 minutes on the average stoppage. However, if the cut-out operates again when the obstruction is removed, it is well to call the electrician before repeating the attempt to start.

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Across-the-line starting requires greater rated capacity in belts, chains, gears, or other drive equipment between the motor and the driven unit than when starting equipment is used. Some engineers consider across-the-line starting as a heavy shock load because of the sudden jerk when power is applied.

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Lubrication is of sufficient importance to place a good man at the work. There is much more to the job than up-ending an oil can over an oil hole. Most important of all is the oiler's ability to see and anticipate impending trouble so that the preventive remedy may be applied in time.

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Good quality belts are made only from first-grade steer hides. Since it is impossible to inspect the steers, it is wise to select a source of supply with a reputation for quality on which you can rely.

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If a flexible coupling begins to run hot, check for excessive misalignment. Flexible couplings are designed to take care of a certain amount of misalignment, but only within definite limits.

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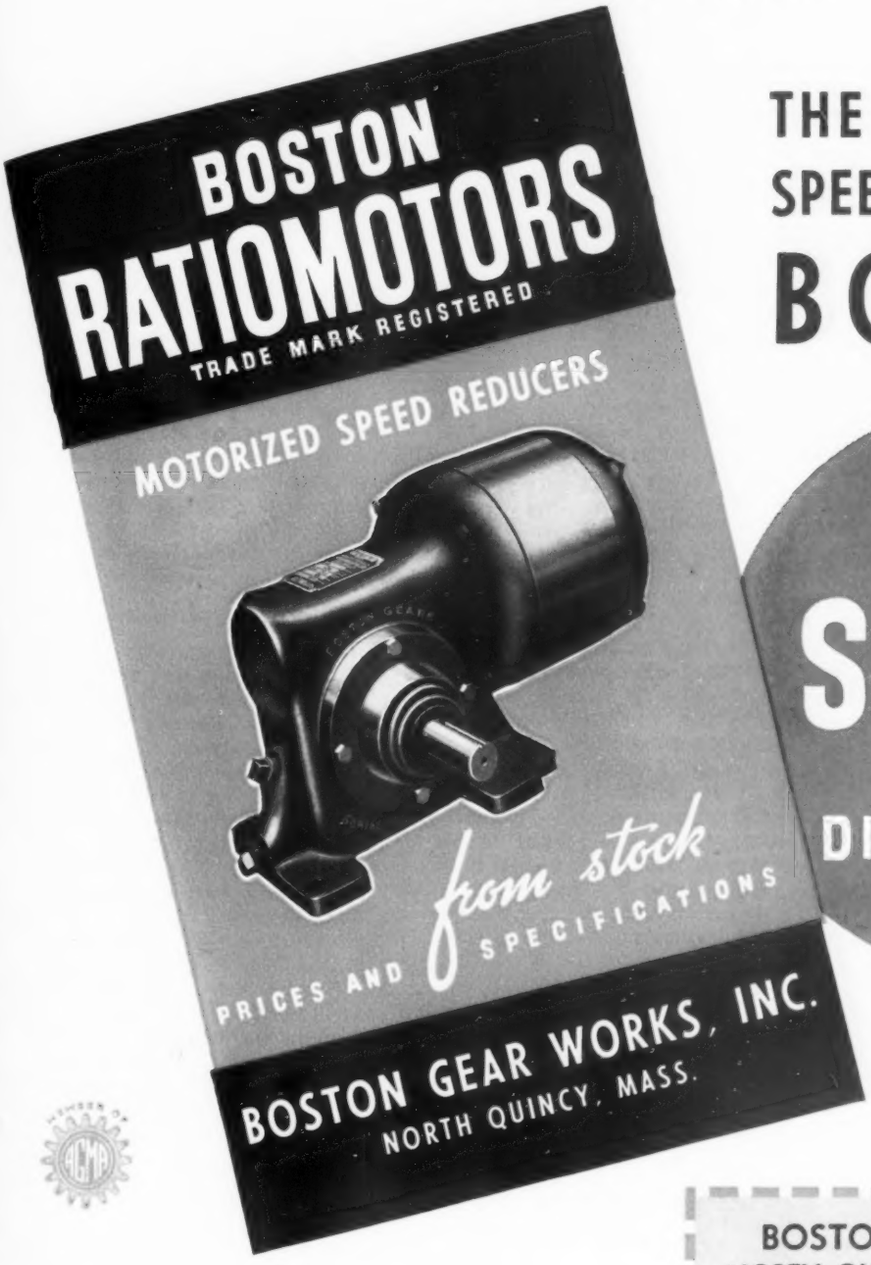

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Gear Manufacturers Center

Attention on Design and Service of Their Product

DESIGNING gears for quiet operation, recent developments in gear making practice, service performance of gear reduction units, elimination of manufacturing waste, plant economics and many committee reports, were among subjects discussed at the nineteenth semiannual meeting of the American Gear Manufacturers association, Sept. 8-10.

Establishing a precedent, the association held its meeting on board the S. S. SEEANDBEE while the ship cruised the Great Lakes from Chicago to Mackinac Island to Cleveland. Technical sessions were held on each of three afternoons. General phases of the meeting were reported in STEEL for Sept. 14, page 27.

Quiet High-Speed Gears

With a general insistence for relatively silent machinery, gear makers are giving more attention to the design and production of quiet high-speed gearing. Discussing this subject in a paper, "Designing High-Speed Gears for Quiet Operation," W. P. Schmitter, Falk Corp., Milwaukee, stated it is only natural then that quantitative technical analysis of gear noise is being given secondary consideration, while the qualitative values concerned with human comfort are drawing primary attention.

Unfortunately, he said, it is not always possible to anticipate the character of noise to which exception will be taken, to say nothing of the lack of instruments suitable for identifying or measuring it. Faulty gear operation may result from the presence of one or more of the following:

A. Disturbances over which designer has considerable influence: 1. Those caused by the transient nature of the tooth loading, especially as regards its movement across the face; 2. those due to critical speeds.

B. Disturbances over which designer has limited influence: 1. Those due to change from rolling to sliding on the tooth profiles and changes in direction of sliding as engagement moves in and out from the pitch circle; 2. angular accelerations arising from torsional deflection in shafts and pinion teeth; 3. those due to bending of pinion or shafts; 4. impacting and splashing of the lubricant.

C. Disturbances over which the gear shop has chief control: 1. Those due to errors in tooth spacing; 2. those due to deviations from the perfect involute; 3. those due to "runout" of the apex of herringbone gears; 4. those due to the presence of flats, burrs, roughness of the teeth, and incomplete surface refinement; 5. those arising from misalignment of the axes; 6. those due to unbalance in rotating masses, also couples due to rotating masses.

D. Disturbances over which the gear designer has little or no control: 1. Torque fluctuations due to impulses in the driving means; 2. torque fluctuations of the driven machinery, such as variations as exist in pumps, blowers, etc.; 3. couples due to gyroscopic effect of rotating masses.

There is no single specific for gear noise and there is little in the way of criteria upon which to forecast performance, Mr. Schmitter stated. There are, however, certain requirements which, if not satisfied, will certainly lead to disappointment, and yet their apparent complete fulfillment is not altogether a guarantee of a quiet gear. The manufacture of high-speed gearing is today as much of an art as an exact science despite fruitful gains of the last few years.

How To Reduce Noise

From an analysis of the disturbances responsible for gear noise, Mr. Schmitter prescribed the following as essential to a quiet operating pair of herringbone gears:

1. Division of the teeth permanently accurate.

2. Shafts true, concentric with the teeth, round, and spaced to allow for a proper running clearance.

3. Revolving parts in correct running balance.

4. Shafts parallel to each other under all conditions.

5. Spiral angles correct and matched.

6. Tooth profiles of correct form to transmit uniform velocity despite deflections that may occur under load.

7. Tooth surfaces finished smoothly.

8. Helical design such that there is sufficient overlap and the axial contact migration under load not excessive.

9. Teeth properly lubricated.

10. No functional interference arising from elastic distortions of pinion shafts or supports.

The author stated that commercial gears cannot be operated at high speeds due to the fact that they will destroy themselves by virtue of the loads resulting from their own errors. The problem of high-speed gearing is not so much a matter of designing against the applied loads as the loads created within themselves.

Application Often To Blame

Gear noise frequently is a result of the application and not the gears, it was pointed out by Ira Short, Westinghouse Electric & Mfg. Co., South Philadelphia, Pa. Temperature also has an influence. He pointed to an instance in which like gears were installed on alternating-current and direct-current generators; one set was noisy, the other quiet. Loose wedges were discovered in the noisy generator and when these were tightened, the gears operated quietly.

A. A. Ross, General Electric Co., West Lynn, Mass., said that his company uses instruments to measure the vibration of gears at different speeds. Later, in cases in which the gears may become noisy, in service, the information thus obtained may be useful in seeking out the cause of the trouble.

A discussion of factors to be considered in the design of gear units constituted a paper presented by C. B. Connell, Nuttall works, Westinghouse Electric & Mfg. Co., Pittsburgh. Titled "Relations Between Load Rating and Design Stresses of Gear Units", this paper stated that in designing a special machine to do a specific job, the design engineer must consider certain fundamentals regarding the stress of working parts. All working parts must be designed to safe working stresses.

These values are determined by the type of load imposed on each

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METAL SHOW ISSUE

part as to magnitude and frequency, type of stress, whether bending, shear, compression or combined stress, consideration of shape of the particular part which may cause stress concentration and use of the proper stress concentration factor, the relation of normal stresses to peak stresses, strength of material available or best suited in relation to the limiting type of stress.

To determine the load imposed on each part, it is necessary to consider the work done by the machine, method and type of power supply and its connecting parts, relation of each part to the power supply and the work to be done, the author stated. If the work done by the machine is of a nature that impact loads are encountered, the load on each part must be calculated from the power to overcome the impact load.

If the source of supply is of a nature to cause high torques, the load must be calculated in relation of the particular part of the machine to the power supply and work to be done. A specially-designed machine, therefore, must contain an in-built service and application factor to enable the machine to do the work for which it is intended.

From this point on in the paper, Mr. Connell discussed the determination of stresses, types of loads, and design problems for specific applications.

In concluding, he said that a speed reducer will fail when some part is overstressed; this may be the gears, shafts, or bearings, depending on the part that is the basis of rating at that particular speed and ratio. Gear teeth may fail due to tooth breakage, indicating fatigue, due to excessive bending stress from shock, or by progressive pitting, indicating high compressive stresses.

Pitting may start in a couple of hours of operation and ruin the gears in a very short time or the pitting may be gradual, shortening the gear life. Shafts fail due to fatigue caused by high stresses. Bearings may fail in a short time or may run for months, depending entirely on the stress imposed on them.

Hypoid Gears Shown

Depending largely upon stereopticon slides, A. H. Candee, Gleason Works, Rochester, N. Y., contributed a paper "Recent Developments in Bevel and Hypoid Gearing." Much interest centered in the illustrations of hypoid gears, the nature of which permits offsets in shafts and the use of bearings on both sides of gears and pinions. Hypoid gears have been receiving considerable attention recently because of their increasing use in automobile drives. By placing the driveshaft pinion below the axis of the ring gear, bodies can be built lower and without the driveshaft tunnel in the rear seat floor.

According to Mr. Candee, teeth of hypoid gears are not claimed to be any better or any worse than the teeth of spiral bevel gears, thus the two types of gears appear to be on a par mechanically. The author showed many slides of applications of both hypoid and spiral bevel gears and discussed problems in connection with their manufacture. A wide range of gears can be generated on hypoid equipment, he said.

The economics of gear manufacturing were outlined in a paper by J. H. Jackson, Pittsburgh Gear & Machine Co., Pittsburgh. He listed the following factors as causing increases in production costs:

1. Encouragement given to labor by federal and local governments to demand and obtain higher wages.

2. Natural and artificial causes that have increased cost of food and clothing, making it necessary for labor to have higher wages.

3. Monetary policies of the federal government, although reacting more slowly than the brain trust expected, are now beginning to influence the general price level of all products.

4. Taxes will continue on high levels. The social security taxes will add 9 per cent to payrolls. Sales taxes, capital stock taxes, real estate taxes and many others can be expected to go up and not down.

5. Restrictive legislation, such as the Walsh-Healy government contracts act and the Patman-Robinson antiprice discrimination act, just naturally add to the cost of doing business.

Depreciation Charges Inadequate

Dealing with depreciation charges, Mr. Jackson stated that in the printed instructions which the internal revenue department has given to examiners, gear cutting machinery is listed as having an 18-year life. Gear makers believe this figure does not permit an adequate deduction. Some companies have been allowed to use a higher depreciation rate.

A more satisfactory method for calculating depreciation, the speaker pointed out, would be to establish depreciation charges on the basis of about 20,000 hours life for each machine, thus varying the charge per year directly in proportion to the usage of each machine. From a tax saving standpoint, this would be ideal because it would result in a low charge-off in poor years when companies lose money without any depreciation charges, and would give a high charge-off in prosperous years.

In discussion of Mr. Jackson's paper, considerable discussion centered about the matter of depreciation. Howard Dingle, president, Cleveland Worm & Gear Co., Cleveland, stated that income tax examiners do not object to lowering depreciation rates on machines, but do object to higher rates being approved when the actual hours of operation of machines were definitely known.

Preventive measures and methods employed by the Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., to dispose advantageously of manufactured material and products which are affected by obsolescence and inactivity were discussed in a paper, "Waste Prevention, Reclamation and Salvage," read by T. H. Owens, of the company's employes' service department. Principal interest in the paper centered in the section dealing with waste prevention in connection with raw and semifinished materials.

Manufacturing processes are a fertile field for waste and they must be watched constantly, said Mr. Owens. Workmen, who see and handle material, are in position to note possibilities of savings on processes, materials, design, etc., and they should be encouraged to be alert to those things. Westinghouse uses a suggestion system by which employes are rewarded for worth-while ideas. These cover kinds and sizes of materials, machining, fitting and assembling operations, machine and hand tools, safety, sanitation, and the like.

Waste Reduction Methods

A principal cause of wastefulness and carelessness, continued the speaker, is the fact that employes do not ordinarily realize the cost of materials, tools and supplies which they handle. The company acquaints workmen with costs of materials and tools by means of bulletins issued from time to time. Many of these show the cost per pound, foot or piece and the scrap value of the same quantities.

Waste elimination campaigns are conducted periodically, and spoiled and defective materials are mounted on boards, some of which, being portable, are displayed in all departments. Other display boards contain posters on water, gas, compressed air, steam, oil, light, power, etc. All of these specify the costs of materials displayed or illustrated. Employes are urged to look for possibilities of savings and special prizes, additional to the regular awards, are given to a number of those whose suggestions are considered to have unusual merit.

In the opinion of Mr. Owens, the principal thing to do in combating waste is to develop a consciousness of it throughout the entire organization. If employes can be made to understand that waste reduces the amount of money in their pay envelopes, the battle is more than half won.

"Our trouble has been due largely to accepting waste as a necessary evil, instead of regarding it as preventable," he concluded. "There

(*Please turn to Page* 66)

PROGRESS IN STEELMAKING

Number of Shapes Reduced

Open-hearth shops, which require from 15,000 to 25,000 tons of hot metal a month, find mixer-type cars highly suitable as well as economical. From 60,000 to 100,000 tons of molten iron is carried on one lining of mixer-type ladles depending upon the length of haul, analysis of the metal and the number of times they are refilled and emptied. Flint clay brick laid up with fireclay mortar of the same analysis is used for lining. Only three brick shapes now are required compared with around 20 special shapes as formerly. Sculling with this type ladle seldom occurs.

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Gas Alarm Warns Operator

Safe handling of the fuel gas used at a stripsheet mill in the Great Lakes district is insured by a device known as a low-pressure gas alarm. The device is mounted on one of the combustion control panels. The signal sets off a siren when the gas-line pressure drops to a predetermined point. With this danger signal to the furnace operator there is no chance of producing a suction in the gas mains, with the resultant danger of explosion. On being thus warned, the furnace operator either reduces the amount of gas being used or shuts it off entirely until the pressure returns to normal. The furnace installation with its complete control system, has proved efficient and satisfactory, and it is felt that the study and cost expended to install the complete combustion control are well justified.

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Markets Dry Flue Damper

A noncooled flue damper for regulating and reversing service on open-hearth furnaces, soaking pits and heating furnaces has been introduced. The unit is built with a heat-resisting, alloy steel seat and gate enclosed above the floor level with a steel plate housing on which is mounted an integral motor-driven mechanism for raising and lowering the gate. Sections of the gate are interlocked with each other and are mounted on a central stem which permits individual units to expand and contract independently thereby preventing warpage and leakage. A magnetic brake holds the gate in any desired position, while limit switches fix the upper and lower limits of travel.

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Controls Cooling of Rails

Shatter cracks in steel rails are caused by transverse fissures, according to two steelworks investigators, and may be prevented by subjecting the rails to controlled cooling. Practice at one plant includes cooling the rails on the hot bed in the usual manner until the temperature recedes to 1000 degrees Fahr. but not less than 932 degrees Fahr. A sufficient number of the rails then are placed in a tank to insure a slow and gradual drop in temperature. Each tank is covered with the joints made tight to prevent currents of cool air coming in contact with the steel. The rails are allowed to remain in the tanks until their temperature drops below 400 degrees Fahr. Controlled-cooled rails show substantially higher results in bend tests. Ductility is better.

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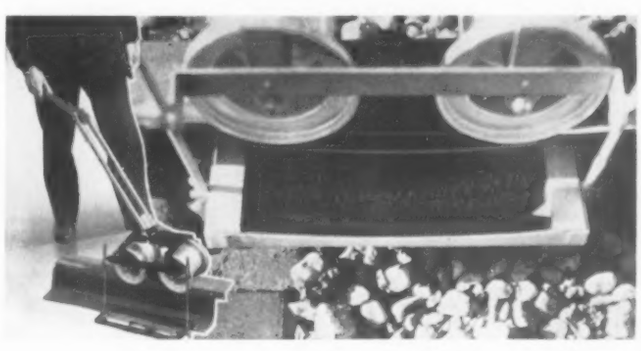
Coated Guides Reduce Scrap

One of the largest savings effected by hard-facing in the steel industry has been made on various type rolling mill guides. At one large mill a cast-steel guide on the first finishing stand had to be changed every week and, after the first campaign, had to be reground every 3 hours. Hard facing the guide on this operation afforded a run of 10 weeks without substitution. Not only has a substantial saving been effected through a reduction in the time loss involved in changing guides but the percentage of scrap and seconds has been reduced materially.

Inspection of Steel Plant Hot Metal Tracks for Defects Is Facilitated by Use of Mirror

INSPECTION frequently is given to the wheels and other parts of the running gear of hot metal trains which operate between many of the blast furnaces and steelworks in this country. To speed up the rigid inspection of rails and at the same time to make more effective the work of the rail inspector, a simple optical device has been developed by the Magnetic Signal Co., Los Angeles, Calif. The device is shown in use and in detail in the accompanying illustration. It consists of a light truck with two double flanged wheels, an adjustable handle and an adjustable curved, magnifying mirror. Setting the handle for his normal walking position and setting the mirror to give him a comprehensive view of the web and underside of the rail head the track walker simply pushes the machine ahead of him along the rail, watching the mirror for reflections of flaws, cracks and corrosion which otherwise would be hid from view. The right hand portion of the cut shows a serious split near the junction of the head and web, as it appears to an operator using the device as indicated at the left side of the illustration.



Hidden defects in rails are revealed to inspector through the medium of traveling magnifying mirror

NEW EQUIPMENT

Diesel Engine—

Ingersoll-Rand Co., 11 Broadway, New York, recently announced its new Type S Diesel engine. This engine is an improved design of the vertical four cycle, single acting, solid injection type designed to run at medium speeds and built for continuous heavy-duty service. The fundamental design is similar to that of the Ingersoll-Rand locomotive. Type S engines are made with 3, 4, 5, 6 and 8 cylinders for ratings from 150 to 460 horsepower.

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Electric Soldering Irons—

Stanley Rule & Level Plant, New Britain, Conn., announces a new line of electrical soldering irons for operation on either alternating or direct current. The irons have adjustable ventilated handles. By means of a collar and sleeve, the handle may be adjusted to the desired length or removed. Compressed copper tips are provided to assure effective heat conduction and to protect metal connecting surfaces from oxidation and flux corrosion. Sealed heating heads protect the built in windings from air, flux fumes and moisture. Eight sizes are available, ranging from 52 to 435 watts. Cord and resting stand is supplied with each iron.

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Fork Truck—

Mercury Mfg. Co., 4140 South Halsted street, Chicago, has recently completed several newly designed tilting fork tiering trucks. The trucks are of the front wheel drive, rear wheel steering type. The forks are 26 inches long and the machines have capacity of 4000 pounds load 30 inches long. Loads are elevated by a hydraulic lifting system and a lifting height of 52 inches is provided. The truck can be furnished with a telescoping elevating mechanism with a total lift of 10 feet. The forks have a forward tilt of 5 degrees and a backward tilt of 15 degrees. The new model can readily be equipped with a gas-electric unit in place of the battery compartment if desired.

New Mercury tilting tiering fork truck with capacity of 4000 pounds

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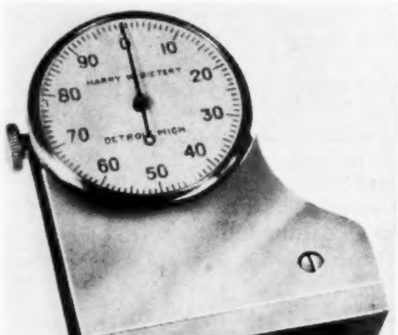
Core Hardness Tester—

Harry W. Dietert Co., 676 West Grand boulevard, Detroit, has recently perfected a new hardness tester for measuring the surface hardness of baked cores and dried sand molds. A test is made by pressing the tester against the surface to be tested and slowly pulling it across the surface. Hardness is registered on a dial. The diamond point which is inserted in the surface is mounted on an independent lever so that the force exerted in moving the indicator along the surface is not recorded on the dial. The mechanism is sealed so that no dirt or dust can enter. The tester is kept in calibration by pressing it against a metal surface plate and setting the dial to zero.

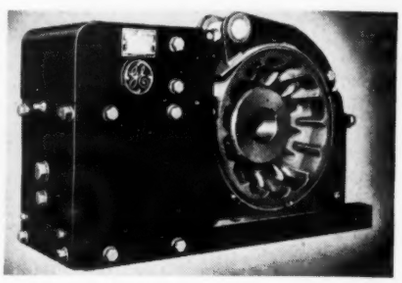


Dietert core hardness tester for testing the surface hardness of baked cores and dry sand molds

♦ ♦ ♦

Magnet Brake—

General Electric Co., Schenectady, N. Y. has recently designed a new three-shoe spring-set direct-current magnet brake which combines the mounting flexibility of the two-shoe brake with the braking surface protection of the band-type brake. The new brake is intended for use with steel mill machinery, cranes, hoists, movable bridges, conveyors and on places where it is necessary to stop and hold a load at the motor armature. The frame is of bar and plate stock steel, welded. Peripheral length of the brake lining is 85 per cent of the wheel periphery, protecting the wheel from dust and dirt. Desired braking characteristics are obtained by adjusting the position of the shoes and the compression of the spring. The actuating mechanism uses a clapper type magnet which is not impaired by accumulations of dust and dirt. All adjustments are accessible from the top of the brake.



General Electric has developed this new three shoe spring set magnet brake

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Drafting Machines—

Charles Bruning Co., 102 Reade street, New York, has announced three new model drafting machines. Each is equipped with an adjustable brake mechanism to prevent the protractor head from sliding on an inclined board and adjustable skid buttons for leveling the scales. Pulleys are fully enclosed and bands may be changed without dissassembling the machine. New Departure fully enclosed lubricated ball bearings are used in con-

struction. Parts are of dull finish aluminum or baked enamel to eliminate reflections. The standard protractor model is designed for use by mechanical, architectural and structural draftsmen. The civil engineers' model is designed to be used by map draftsmen and navigators and the deluxe civil engineers' model has been fitted with a micrometer adjustment screw tangent to the protractor to aid in setting off the correct angle rapidly and accurately.

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Safety Gloves—

Supreme Mfg. Co., 219 Ninth street, Pittsburgh, has recently introduced a new glove for industrial workers emphasizing the safety feature. Gloves are of double palm, cross quilted construction with a cuff inscribed "Safety First — Be Careful." The improved cuff is shorter than the standard cuff on the ordinary gauntlet glove, and protects the worker from getting caught in the machinery.

Supreme safety gloves with insignia printed on the shortened cuff

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Water Coolers—

Westinghouse Electric & Manufacturing Co., Mansfield, O., has announced three new freeze-proof water coolers especially designed for use in temperatures below freezing. The coolers are especially insulated and equipped with thermostatically controlled Corox heating elements mounted in the lower part of the cabinet. The capacities are 9.5, 11.9 and 14.4 gallons of water per hour cooled from 70 to 50 degrees Fahr. Motors and compressors are sealed in a steel case, lubricated for life and water cooled.

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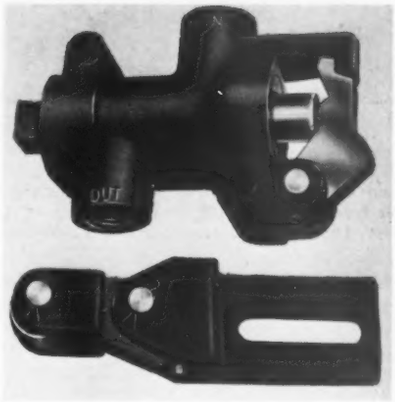
Valves—

Kennedy Valve Mfg. Co., Elmira, N. Y., has recently placed on the market a new line of standard iron body wedge gate valves. Made in all sizes from 1½ inches to 60 inches, these valves are designed for steam working pressures of 150 pounds and water working pressures of 200 pounds. To insure strength and rigidity, metal of dense structure has been used, all bodies are of oval section with rounded corners, flanges and bolts are heavy and ribbing is provided at the flanges of the larger flanged-end valves and at the yokes and caps of outside screw and yoke valves. Heavy bronze bushings are used wherever the stem passes through a cast iron part to prevent corrosion and scoring of the stem.



Above is shown the new work ejector valve developed by C. B. Hunt & Son, with operating bracket shown below

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Work Ejector Valve—

C. B. Hunt & Son, Salem, O., have developed a new work ejector valve for work ejection on punch presses, stamping presses and elsewhere when momentary intermittent application of compressed air can be utilized. Valve cage is cast bronze and provides standard thread half-inch inlet and outlet; cam roller bracket is also bronze, while the valve body is of stainless steel. The valve is actuated by the action of the roller against the cam lever, compressed air being on only during moment of actuation. The valve is closed by spring action. Cam lever, valve body and return spring are the only moving parts in the valve proper. According to the manufacturer, there is no metal-to-metal wear in the valve section, the valve body employing a free floating action in special packings which are so constructed that the air seal becomes tighter as the air pressure increases.

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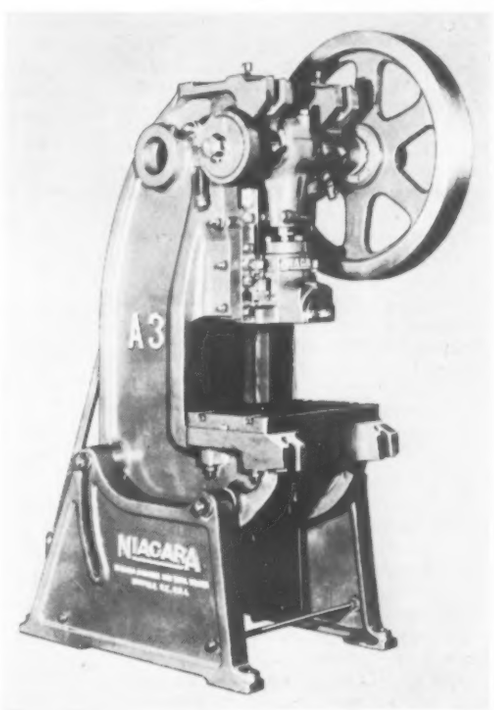
Inclinable Press—

Niagara Machine & Tool Works, Buffalo, N. Y., has added to its line a new inclinable press which has a 3-inch diameter shaft and follows the same design as other new members of the "A" line ranging from 1¼ to 5½-inch shafts. The frame is designed for strength and rigidity. New features include adjustable removable double V-gibs, new type slide with breech block die clamp, 14-point engagement sleeve clutch with built-in single stroke mechanism, crankshaft bearings split at 45 degree angle to transmit entire thrust direct to frame, self contained back shaft assembly mounted on Timken bearings on geared models and accessible one man inclining mechanism equipped with antifriction bearings.



Niagara A-3 inclinable press which embodies many new features

RECENT PUBLICATIONS OF MANUFACTURERS

Copies of any of the literature listed below may be obtained by writing directly to the companies involved, or by addressing STEEL, in care of Readers' Service Department, 1213 West Third Street, Cleveland.

Industrial Products Catalog — Johns-Manville Corp., 22 East Fortieth street, New York. Catalog No. G1-6A, illustrated, contains information and recommendations on high and low temperature insulations.

Steel Frame Skid Platforms—Lyon Iron Works, Greene, N. Y. Loose-leaf bulletin No. 109, describing and illustrating standard skids, illustrations and data on special skid platforms for a wide variety of products.

Flexible Shaft Grinders—Swartz & White Mfg. Co., 243 Water street, Binghamton, N. Y. Catalog illustrating and describing the company's flexible shaft grinders and equipment suitable for operation in any field.

Steel and Wood Screws—Elco Tool & Screw Corp., Rockford, Ill. Catalog No. 36, on Elco products, arranged for easy reference; practical information, charts, tables and other data for designers, purchasing agents and other mechanical executives.

All Steel Barrel Truck — Barrett-Cravens Co., 3255 West Thirtieth street, Chicago. Folder describing a new all steel barrel truck designed to handle steel or wood barrels up to 800 pounds, with loose, solid or liquid contents.

Alloy Steels for Electrical, Mechanical and Chemical Purposes — Driver-Harris Co., Harrison, N. J. Catalog No. R-36, compiled as an aid to those upon whom rests the responsibility for proper selection of alloys for electrical, mechanical and chemical purposes.

Steel Tubing — Summerill Tubing Co., Bridgeport, Pa. Booklet pointing out value steel tubing commands as the only aircraft structural material which can be produced quickly enough in large and continued volume to meet demands which would be imposed upon the industry by a national emergency.

Fractional Horsepower V-Belts—B. F. Goodrich Co., Akron, O. Catalog No. 2180, including a set of tables giving the center distances corresponding to every standard Goodrich belt for various speed ratios, motor speeds, and pulley diameters. Data dealing with installation and care of V-belts, application of belts to V-flat drive and significance of standard belt numbers.

Coal and Ash Handling—Fairfield Engineering Co., Marion, O., Catalog 436, illustrations of typical arrangements of skip hoists and other coal and ash-handling equipment. Tables of capacities, descriptive data, views of recent installations in a wide variety of industries and up-to-date information on the entire Fairfield line for boiler houses.

Voltmeters and Ammeters—Bristol Co., Waterbury, Conn. Bulletin No. 436, describing a new line of round chart recording voltmeters and ammeters for electric utilities and industrial plants; models for wall, switchboard, flush panel and pole mounting, as well as for portable use, are illustrated with drilling dimensions.

Centrifugal Oil Extractors and Dryers — National Separator Co., Worcester, Mass. Bulletin describing centrifugals; outboard, horizontal motor drive, without belts, through a compensating shaft, light removable chip pans with and without center sleeve post, oil filtering attachment with safety features and a pan cover lifting device.

Stainless Steel—United States Steel Corp. subsidiaries, P. O. Box 176, Pittsburgh. Booklet on stainless and heat-resisting steels for process industries, including general classifications, the metallurgy of, and analysis of the different types of steel products produced under the "USS" insignia; two tables, one giving a complete analysis of the nominal properties of the various stainless steels, the other giving full test results showing resistance of the stainless steels in three grades to more than 200 acids and chemicals.

Rolling Mill Bearing Problems — Timken Roller Bearing Co., Canton, O. Catalog No. 5M, claims the answer to problems of higher rolling speeds, closer tolerances, production of uniform strip and precision rounds, as well as efficient operation with minimum of attention, lies in the proper application of antifriction bearings to rolling mill equipment.

Technical Handbook—Flexrock Co., 800 North Delaware avenue, Philadelphia. Handbook describing details of application and uses of its materials. Contains detailed drawings explaining the various designs and construction of industrial floors; goes into waterproofing, roof work, sanitation and all types of floor repairs.

Design and Service Hold Attention of Gear Makers

(*Concluded from Page* 62)

are enormous possibilities of savings in a waste prevention program encompassing all activities of a plant and participated in by all employes. Any program adopted should provide an incentive for stimulating the interest of employes, and it should be made clear that savings are reflected in profits, which determine the amount of money in pay envelopes, as well as stockholders' dividends."

E. S. Sawtelle, vice president, Tool Steel Gear & Pinion Co., Cincinnati, and president, American Gear Manufacturers association, presented the report of the industrial relations committee of which he is chairman. He advocated that management use every means at its disposal to keep employes posted on company problems and the effects of legislation on industry.

He recommended particularly making available to employes sound films and other material which the National Metal Trades association, National Association of Manufacturers, and similar organizations have prepared for educational purposes.

H. H. Kerr, vice president, Boston Gear Works Inc., North Quincy, Mass., and vice president, American Gear Manufacturers association, stated that his company posts on its bulletin boards editorials and articles from trade and business magazines, bulletins from trade associations, and similar material. It is found that this material is read and discussed by employes and thereby arouses constructive thinking.

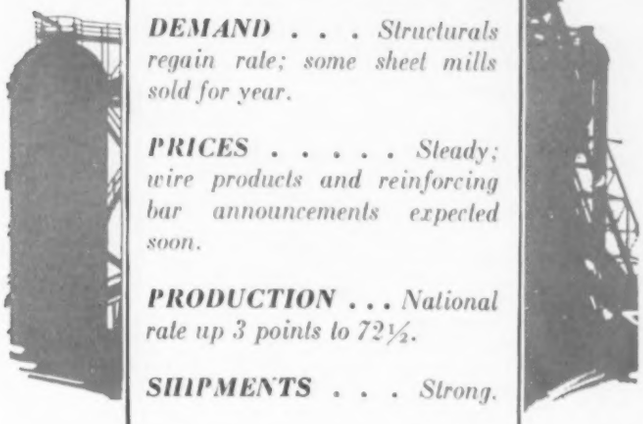
Following up Mr. Owens' observations on the matter of awarding employes for acceptable ideas and suggestions, Mr. Kerr said that his company also is having good success in a similar plan. Boxes marked "Suggestions and Questions" are placed conveniently in the plant and through this channel the company has obtained some fine material from unexpected sources. Good suggestions, whether or not they are used, are paid for in cash.

Many technical committees presented reports, although the majority simply indicated progress since the association's last meeting. These committees are endeavoring to complete recommended standards for the A. G. M. A. looseleaf handbook.

The metallurgical committee, of which C. B. Hamilton Jr., president, Hamilton Gear & Machine Co., Toronto, Ont., is chairman, reported that its work in connection with steels and bronzes is in good shape and will soon be ready for publication. The committee is now working on specifications for cast iron.

Scrap Near Record High; Delivery Is Problem

Shape Awards Rebound; Production Snaps Back; Sheet Mills Well Sold



MARKET IN TABLOID

DEMAND . . . *Structurals regain rate; some sheet mills sold for year.*

PRICES . . . . . *Steady; wire products and reinforcing bar announcements expected soon.*

PRODUCTION . . . *National rate up 3 points to 72½.*

SHIPMENTS . . . *Strong.*

SCRAP holds the limelight, continuing its spectacular rise, a gain of $1 per ton having been made by heavy melting steel at Pittsburgh in the space of a week. At a top of $18.50 this grade is at the level of the second week in September, 1929, and within 75 cents a ton of the peak price, attained in August, 1929. Sale of about 20,000 tons from accumulations of a steelmaker at Pittsburgh indicates belief that present prices are near the top of the movement.

With a higher price level supplies are increasing as collections can be made at greater distances from consuming centers. However, increased shipments have not sufficed to hold back prices. A New York firm is high bidder on dismantling nine government ships which are expected to yield about 10,000 tons.

National operating rate last week rebounded three points to 72½ per cent, regaining ground lost the week of Labor Day and coming within half a point of the peak of 73 in the final week of August. Youngstown, O., made the largest gain, 13 points, to 80 per cent; Buffalo and Detroit gained 5 points. Wheeling 6, Cleveland 2½ points to 82 and eastern Pennsylvania half a point to 48. Other producing centers held the rate of the previous week.

Although automotive consumers of steel have not yet outlined their requirements for sheets and other steel, sufficient demand from that and other sources has appeared to give many sheetmakers full order books for the remainder of this year. It is expected that deliveries of sheets and strip will recede further during the fall, under increased specifying by users. The same is true of bars and other products going into miscellaneous fabrication.

Prices for fourth quarter are well settled except for wire products and reinforcing bars, on which definite announcements are expected by the end of this week. Consumers do not appear to have changed their position materially except that they are covering requirements somewhat more broadly as to delivery. Speculative buying seems at a minimum, prompt delivery being of more importance than price in many instances, indicating small stocks and insistent demand for fabrication.

Railroads continue to buy, but sparingly, expected heavy placements not yet developing. Central of Georgia has placed 5000 tons of rails and a large order for fastenings and an inquiry is expected shortly from the Western Pacific for 100 and 110-pound rails to relay 491 miles of track. This road plans to buy additional cars and locomotives also. Birmingham Southern, subsidiary of the Tennessee company, has bought nine diesel-electric locomotives.

After a lull structural steel has taken a spurt and awards for the week are 42,737 tons, compared with 19,305 tons for the week preceding. Included in recent lettings are 7000 tons for a bridge at Hartford, Conn., 6000 tons for an extension to the West Side highway in New York and 5800 tons for roofs over railroad tracks for the New York Central in New York. A flood of inquiries has just been loosed for steel for bridges and highway grade separations in eastern states. Pending structural work includes 4600 tons for a bridge from Easton, Pa., to Phillipsburg, N. J., 1000 tons for an ethyl plant for the du Ponts and 12,000 tons expected to be on inquiry soon for three school buildings at Philadelphia.

STEEL's composite of scrap prices has advanced 67 cents in the past week to $16.54, the highest since September, 1929, and within 16 cents of the peak of $16.70 in August, 1929. Lifted by scrap the iron and steel composite has risen 12 cents to $34.22. The finished steel composite is unchanged at $53.

COMPOSITE MARKET AVERAGES

	Sept. 19	Sept. 12	Sept. 5	One Month Ago Aug., 1936	Three Months Ago June, 1936	One Year Ago Sept., 1935	Five Years Ago Sept., 1931
Iron and Steel	$34.22	$34.10	$34.10	$33.88	$32.79	$32.82	$30.61
Finished Steel	53.00	53.00	53.40	53.40	52.20	53.70	48.72
Steelworks Scrap	16.54	15.87	15.79	14.66	12.55	12.65	8.82

Iron and Steel Composite:—Pig iron, scrap, billets, sheet bars, wire rods, tin plate, wire, sheets, plates, shapes, bars, black pipe, rails, alloy steel, hot strip, and cast iron pipe at representative centers. Finished Steel Composite:—Plates, shapes, bars, hot strip, nails, tin plate, pipe. Steelworks Scrap Composite:—Heavy melting steel and compressed sheets.

A COMPARISON OF PRICES

Representative Market Figures for Current Week; Average for Last Month, Three Months and One Year Ago

Finished Material

	Sept. 19, 1936	Aug., 1936	June, 1936	Sept., 1935
Steel bars, Pittsburgh	1.95c	1.95c	1.85c	1.85c
Steel bars, Chicago	2.00	2.00	1.90	1.85
Steel bars, Philadelphia	2.26	2.26	2.16	2.11
Iron bars, Terre Haute, Ind.	1.85	1.85	1.75	1.75
Shapes, Pittsburgh	1.90	1.90	1.80	1.80
Shapes, Philadelphia	2.11½	2.11½	2.01½	2.01½
Shapes, Chicago	1.95	1.95	1.85	1.85
Tank plates, Pittsburgh	1.90	1.90	1.80	1.80
Tank plates, Philadelphia	2.09	2.09	1.99	1.99
Tank plates, Chicago	1.95	1.95	1.85	1.85
Sheets, No. 10, hot rolled, Pitts.	1.95	1.95	1.85	1.85
Sheets, No. 24, hot ann., Pitts.	2.50	2.50	2.40	2.40
Sheets, No. 24, galv., Pitts.	3.20	3.20	3.10	3.10
Sheets, No. 10, hot rolled, Gary	2.05	2.05	1.95	1.95
Sheets, No. 24, hot anneal., Gary	2.60	2.60	2.50	2.50
Sheets, No. 24, galvan., Gary	3.30	3.30	3.20	3.20
Plain wire, Pittsburgh	2.40	2.40	2.40	2.30
Tin plate, per base box, Pitts.	5.25	5.25	5.25	5.25
Wire nails, Pittsburgh	1.90	2.10	2.10	2.40

Semifinished Material

Sheet bars, open-hearth, Youngs.	$30.00	30.00	28.00	28.00
Sheet bars, open-hearth, Pitts.	30.00	30.00	28.00	28.00
Billets, open-hearth, Pittsburgh	30.00	30.00	28.00	27.00
Wire rods, Pittsburgh	38.00	38.00	38.80	38.00

Pig Iron

	Sept. 19, 1936	Aug., 1936	June, 1936	Sept., 1935
Bessemer, del. Pittsburgh	$20.8132	20.8132	20.8132	19.81
Basic, Valley	19.00	19.00	19.00	18.00
Basic, eastern del. East. Pa.	20.8132	20.8132	20.8132	19.81
No. 2 fdy., del. Pittsburgh	20.3132	20.3132	20.3132	19.31
No. 2 fdy., Chicago	19.50	19.50	19.50	18.50
Southern No. 2, Birmingham	15.50	15.50	15.50	14.50
Southern No. 2, del. Cincinnati	19.44	19.44	20.2007	19.38
No. 1 2X eastern, del. Phila.	21.6882	21.6882	21.6882	20.68
Malleable, Valley	19.50	19.50	19.50	18.50
Malleable, Chicago	19.50	19.50	19.50	18.50
Lake Sup., charcoal, del. Chicago	25.2528	25.2528	25.2528	24.25
Ferromanganese, del. Pitts.	80.13	80.13	80.13	90.13
Gray forge, del. Pittsburgh	19.6741	19.6741	19.6741	18.67

Scrap

Heavy melting steel, Pittsburgh	$18.25	16.00	13.80	13.45
Heavy melt. steel, No. 2, east. Pa.	13.75	12.80	10.81	11.25
Heavy melting steel, Chicago	16.25	15.45	12.75	12.55
Rail for rolling, Chicago	16.75	16.40	14.00	13.90
Railroad steel specialties, Chicago	17.75	16.65	14.40	13.75

Coke

Connellsville, furnace, ovens	$4.00	3.45	3.50	3.25
Connellsville, foundry, ovens	4.25	4.25	4.25	4.00
Chicago, by-product foundry, del.	9.75	9.75	9.75	9.25

Steel, Iron, Raw Material, Fuel and Metals Prices

Except when otherwise designated, prices are base, f.o.b. cars. Asterisk denotes price change this week.

Sheet Steel

Prices Subject to Quantity Extras and Deductions (Except Galvanized)

Hot Rolled No. 10, 24-48 in.

Pittsburgh	1.95c
Gary	2.05c
Chicago, delivered	2.08c
Detroit, del.	2.15c
New York, del.	2.30c
Philadelphia, del.	2.26c
Birmingham	2.10c
St. Louis, del.	2.28c
Pacific ports, f.o.b. cars, dock	2.50c

Hot Rolled Annealed No. 24

Pittsburgh	2.50c
Gary	2.60c
Chicago, delivered	2.63c
Detroit, delivered	2.70c
New York, del.	2.85c
Philadelphia, del	2.81c
Birmingham	2.65c
St. Louis, del	2.82c
Pacific ports, f.o.b. cars, dock	3.15c

Galvanized No. 24

Pittsburgh	3.20c
Gary	3.30c
Chicago, delivered	3.33c
Philadelphia, del.	3.51c
New York, del.	3.55c
Birmingham	3.35c
St. Louis, del.	2.33c
Pacific ports, f.o.b. cars, dock	3.80c

Tin Mill Black No. 28

Pittsburgh	2.75c
Gary	2.85c
St. Louis, delivered	3.08c

Cold Rolled No. 10

Pittsburgh	2.60c
Gary	2.70c
Detroit, delivered	2.80c
Philadelphia, del.	2.91c
New York, del.	2.95c
Pacific ports, f.o.b. cars, dock	3.20c

Cold Rolled No. 20

Pittsburgh	3.05c
Gary	3.15c
Detroit, delivered	3.25c
Philadelphia, del.	3.36c
New York, del.	3.40c

Enameling Sheets

Pittsburgh, No. 10	2.45c
Pittsburgh, No. 20	3.05c
Gary, No. 10	2.55c
Gary, No. 20	3.15c

Tin and Terne Plate

Gary base, 10 cents higher.

Tin plate, coke base (box) Pittsburgh	$5.25
Do., waste-waste	2.75c
Do., strips	2.50c
Long ternes, No. 24 unassorted, Pitts.	3.50c
Do., Gary	3.60c

Corrosion and Heat-Resistant Alloys

Pittsburgh base, cents per lb.

Chrome-Nickel

	No. 302	No. 304
Bars	23.00	24.00
Plates	26.00	28.00
Sheets	33.00	35.00
Hot strip	20.75	22.75
Cold strip	27.00	29.00

Straight Chromes

	No. 410	No. 430	No. 442	No. 446
Bars	17.00	18.50	21.00	26.00
Plates	20.00	21.50	24.00	29.00
Sheets	25.00	28.00	31.00	35.00
Hot strip	15.75	16.75	21.75	26.75
Cold stp.	20.50	22.00	27.00	35.00

Steel Plate

Pittsburgh	1.90c
New York, del.	2.19c
Philadelphia, del.	2.09c
Boston, delivered	2.32c
Buffalo, delivered	2.15c
Chicago or Gary	1.95c
Cleveland, del.	2.09½c
Birmingham	2.05c
Coatesville, base	2.00c
Sparrows Pt., base	2.00c
Pacific ports, f.o.b. cars, dock	2.45c
St. Louis, delivered	2.18c

Structural Shapes

Pittsburgh	1.90c
Philadelphia, del.	2.11½c
New York, del.	2.16¼c
Boston, delivered	2.30½c
Bethlehem	2.00c
Chicago	1.95c
Cleveland, del	2.10c
Buffalo	2.00c
Gulf Ports	2.30c
Birmingham	2.05c
Pacific ports, f.o.b. cars, dock	2.45c

Bars

Soft Steel

(Base, 3 to 25 tons)

Pittsburgh	1.95c
Chicago or Gary	2.00c
Duluth	2.10c
Birmingham	2.10c
Cleveland	2.00c
Buffalo	2.05c
Detroit, delivered	2.10c
Pacific ports, f.o.b. cars, dock	2.50c
Philadelphia, del.	2.26c
Boston, delivered	2.37c
New York, del	2.30c
Pitts., forg. qual.	2.20c

Rail Steel

To Manufacturing Trade

Pittsburgh	1.80c
Chicago or Gary	1.85c
Moline, Ill.	1.85c
Cleveland	1.85c
Buffalo	1.90c

Iron

Terre Haute, Ind...	1.85c
Chicago	1.90c
Philadelphia	2.16c
Pittsburgh, refined..	2.75-7.50c

Reinforcing

New billet, straight lengths, quoted by distributors.

Pittsburgh	2.05c
Chicago, Gary, Buffalo, Cleve., Birm., Young...	2.10c
Gulf ports	2.45c
Pacific coast ports f.o.b. car docks	2.45c
Philadelphia, del.....	2.26c-2.36c

Rail steel, straight lengths, quoted by distributors

Pittsburgh	1.90c
Chicago, Buffalo, Cleveland, Birm., Young.....	1.95c
Gulf ports	2.30c

Wire Products

(Prices apply to straight or mixed carloads; less carloads $4 higher; less carloads fencing $5 over base column.)

Base Pitts.-Cleve. 100 lb. keg.

Standard wire nails	1.90c
Cement coated nails	1.90c
Galv. nails, 15 gage and finer	3.90c
do. finer than 15 ga...	4.40c

(Per pound)

Polished staples	2.60c
Galv. fence staples	2.85c
Barbed wire, galv.	2.40c
Annealed fence wire.....	2.65c
Galv. fence wire	3.00c
Woven wire fencing (base column, c. l.).....	$57.00

To Manufacturing Trade

Plain wire, 6-9 ga..	2.40c

Anderson, Ind. (merchant products only) and Chicago up $1; Duluth up $2; Birmingham up $3.

Spring wire, Pitts. or Cleveland	3.05c

Do., Chicago up $1, Worc. $2.

Cold-Finished Carbon Bars and Shafting

Base, Pitts., one size, shape, grade, shipment at one time to one destination

10,000 to 19,999 lbs.	2.25c
20,000 to 59,999 lbs.	2.20c
60,000 to 99,999 lbs.....	2.15c
100,000 lbs. and over.....2.12½c	

Gary, Ind., Cleve., Chi., up 5c; Buffalo, up 10c; Detroit, up 15c; eastern Michigan, up 20c.

Alloy Steel Bars (Hot)

(*Base, 3 to 25 tons.*)

Pittsburgh, Buffalo, Chicago, Massillon, Canton, Bethlehem 2.55c

Alloy S.A.E.	Diff.	Alloy S.A.E.	Diff.
2000	0.25	3100	0.55
2100	0.55	3200	1.35
2300	1.50	3300	3.80
2500	2.25	3400	3.20

4100 0.15 to 0.25 Mo.	0.50
4600 0.20 to 0.30 Mo. 1.25-1.75 Ni.	1.05
5100 0.80-1.10 Cr.	0.45
5100 Cr. spring	base
6100 bars	1.20
6100 spring	0.70
Cr., Ni., Van.	1.50
Carbon Van.	0.95
9200 spring flats	base
9200 spring rounds, squares	0.25

Piling

Pittsburgh	2.25c
Chicago, Buffalo	2.35c

Strip and Hoops

(Base, hot rolled, 25-1 ton)
(Base, cold-rolled, 25-3 tons)

Hot strip to 23⅞-in.	
Pittsburgh	1.95c
Chicago or Gary	2.05c
Birmingham base	2.10c
Detroit, del.	2.15c
Philadelphia, del.	2.26c
New York, del.....	2.30c
Cooperage hoop,	
Pittsburgh	2.05c
Chicago	2.15c
Cold strip, 0.25 carbon and under,	
Pitts., Cleveland..	2.60c
Detroit, del.	2.81c
Worcester, Mass..	2.80c

Carbon	Cleve-Pitts.	Worcester, Mass.
0.26—0.50....	2.60c	2.80c
0.51—0.75....	3.45c	3.65c
0.76—1.00....	4.95c	5.15c
Over 1.00....	6.50c	6.70c

Rails, Track Material

(Gross Tons)

Standard rails, mill	$36.37½
Relay rails, Pitts. 20—100 lbs.	25.50-28.00
Light rails, billet qual. Pitts., Chi....	$35.00
Do., reroll. qual....	34.00
Angle bars, billet, Gary, Ind., So. Chi.	2 55c
Do., axle steel.....	2.10c
Spikes, R. R. base..	2.75c
Track bolts, base....	3.75c
Tie plates, base.....	2.00c

Base, light rails 25 to 40 lbs.; 50 to 60 lbs. inclusive up $2; 16 and 20 lbs., up $1; 12 lbs. up $2; 8 and 10 lbs., up $5. Base railroad spikes 200 kegs or more; base tie plates 20 tons.

Bolts and Nuts

Pittsburgh, Cleveland, Birmingham, Chicago. Discounts to legitimate trade as per Dec. 1, 1932, lists:

Carriage and Machine

½ x 6 and smaller.....70-10 off	
Do. larger .....70-5 off	
Tire bolts .....50 off	

Plow Bolts

All sizes .....70-5 off	

Stove Bolts

In packages with nuts attached 75 off; in packages with nuts separate 75-5 off; in bulk 82½ off on 15,000 of 3-inch and shorter, or 5000 over 3-inch.

Step bolts .....65 off	
Elevator bolts .....65 off	

Nuts

S. A. E. semifinished hex.:	
½ to 1⅛-inch.....60-20-15 off	
Do., ½ to 1-inch....60-20-15 off	
Do., over 1-inch....60-20-15 off	

Hexagon Cap Screws

Milled .....80-10-10 off	
Upset, 1-in., smaller .....85 off	

Square Head Set Screws

Upset, 1-in., smaller.....75-10 off	
Headless set screws .....75 off	

Rivets, Wrought Washers

Struc., c. l., Pittsburgh, Cleveland	3.05c
Struc., c. l., Chicago	3.15c
⅞-in. and smaller, Pitts., Chi., Cleve.	70 and 5 off
Wrought washers, Pitts., Chi., Phila. to jobbers & large nut, bolt mfrs....	$6.25 off

Cut Nails

Cut nails, Pitts.; (10% discount on size extras)	$2.75
Do. less carloads, 5 kegs or more, no discount on size extras	$3.05
Do., under 5 kegs; no disc. on size extras.....	$3.20

Pipe and Tubing

Base $200 net ton, except on standard commercial seamless boiler tubes under 2 inches and cold drawn seamless tubing.

Welded Iron, Steel Pipe

Base discounts on steel pipe, Pitts., Lorain, O., to consumers in carloads. Gary, Ind., 2 points less. Chicago, del. 2½ points less. Wrought pipe, Pittsburgh.

Butt Weld

In.	Blk.	Galv.
Steel		
¼ and ⅜	60	44½
½	64½	55
¾	67½	59
1—3	69½	61½
Iron		
⅛	31½	15
¼	36½	20½
⅜—1¼	39½	25½
2	41½	26

Lap Weld

Steel		
2	62	53½
2½—3	65	56½
3½—6	67	58½
7 and 8	66	56½
9 and 10	65½	56
Iron		
2	37	22½
2½—3½	38	25
4—8	40	28½

Line Pipe

Steel	
⅛, butt weld	56
¼ and ⅜, butt weld	59
½, butt weld	63½
¾, butt weld	66½
1 to 3, butt weld	68½
2, lap weld	61
2½ to 3, lap weld	64
3½ to 6, lap weld	66
7 and 8, lap weld	65
Iron	

⅛—1½ inch, black and galv. take 4 pts. over; 2½—6 inch 2 pts. over discounts for same sizes, standard pipe lists, 8—12-inch, no extra.

Boiler Tubes

C. L. Discounts, f.o.b. Pitts.

Lap Weld Steel		Charcoal Iron	
2—2¼	33	1¾	8
2½—2¾	40	2—2¼	13
3	47	2½—2¾	16
3¼—3½	50	3	17
4	52	3¼—3½	18
4½—5	42	4	20
		4½	21

In lots of a carload or more, above discounts subject to preferential of two 5% and one 7½% discount on steel and 10% on charcoal iron.

Lapwelded steel: 200 to 9999 pounds, ten points under base, one 5% and one 7½%. Under 2000 pounds 15 points under base, one 5% and one 7½%. Charcoal iron: 10,000 pounds to carloads, base less 5%; under 10,000 lbs., 2 points under base.

Seamless Boiler Tubes

Under date of May 15 in lots of 40,000 pounds or more for cold-drawn boiler tubes and in lots of 40,000 pounds or feet or more for hot-finished boiler tubes, revised prices are quoted for 55 cold-drawn boiler tube sizes ranging from ¼ to 6-inch outside diameter in 30 wall thicknesses, decimal equivalent from 0.035 to 1.000, on a dollars and cents basis per 100 feet and per pound. Less-carloads revised as of July 1, 1935, card.

Hot-finished carbon steel boiler tube prices also under date of May 15 range from 1 through 7 inches outside diameter, inclusive, and embrace 47 size classifications in 22 decimal wall thicknesses ranging from 0.109 to 1.000, prices also being on a lb. and 100 ft. basis.

Seamless Tubing

Cold drawn; f.o.b. mill disc.

100 ft. or 150 lbs.	32%
15,000 ft. or 22,500 lbs.....	70%

Cast Iron Water Pipe

Class B Pipe—Per Net Ton

6-in. & over, Birm.	$39.00-40.00
4-in., Birmingham...	42.00-43.00
4-in., Chicago	50.40-51.40
6 to 24-in. Chicago..	47.40-48.40
6-in. & over, east. fdy.	43.00
Do., 4-in.	46.00

Class A pipe $3 over Class B
Stnd. fitgs., Birm. base..$100.00

Semifinished Steel

Billets and Blooms

4 x 4-inch base; gross ton

Pitts., Chi., Cleve., Buffalo & Young.	$30.00
Philadelphia	35.67
Duluth	32.00

Forging Billets

6 x 6 to 9 x 9-in., base

Pitts., Chi., Buff.....	37.00
Forging, Duluth	39.00

Sheet Bars

Pitts., Cleve., Young., Chi., Buff., Canton, Sparrows Pt.	30.00

Slabs

Pitts., Chi., Cleve., Young.	30 00

Wire Rods

Pitts., Cleve., No. 4 to 5	$38.00
Do., No. 5 to ⅜-inch	40.00
Do., over ⅜ to ⅞-inch	40.00

Chicago up $1; Worcester up $2

Skelp

Pitts., Chi., Young., Buff., Coatesville, Sparrows Point....	1.80c

Coke

Price Per Net Ton

Beehive Ovens

Connellsville, fur.....	$3.75- 4.00
Connellsville, fdry..	4.25- 4.50
Connel. prem. fdry.	5.50
New River fdry.....	6.00
Wise county fdry....	4.45- 5.00
Wise county fur.....	4.00- 4.50

By-Product Foundry

Newark, N. J., del.	9.70-10.15
Chi., ov., outside del.	9.00
Chicago, del.	9.75
New England, del....	11.50
St. Louis, del.	10.00-10.50
Birmingham, ovens	6.50
Indianapolis, del.	9.40
Cincinnati, del.	9.50
Cleveland, del.	9.75
Buffalo, ovens	7.50- 8.00
Detroit, ov., out. del.	9.00
Philadelphia, del.	9.38

Coke By-Products

Per gallon, producers' plants.

Tank lots	Spot
Pure and 90% benzol.....	16.00c
Toluol	30.00c
Solvent naphtha	30.00c
Industrial xylol	30 00c

Per lb. f.o.b. Frankford.

Phenol (200 lb. drums)..	15.50c
Do. (450 lbs.)	14.50c

Eastern Plants, per lb.

Naphthalene flakes and balls, in bbls., to jobbers	7.25c

Per 100 lbs. Atlantic seaboard

Sulphate of ammonia.....	$1.275

†Western prices, ½-cent up

Pig Iron

Delivered prices include switching charges only as noted. No. 2 foundry is 1.75-2.25 sil.; 25c diff. for each 0.25 sil. above 2.25; 50c diff. for each 0.25 below 1.75. Gross tons.

Basing Points:	No. 2 Fdry.	Malleable	Basic	Bessemer
Bethlehem, Pa.	$20.50	$21.00	$20.00	$21.50
Birdsboro, Pa.	20.50	21.00	20.00	21.50
Birmingham, Ala., southern del.	15.50	15.50	14.50	21.00
Buffalo	19.50	20.00	18.50	20.50
Chicago	19.50	19.50	19.00	20.00
Cleveland	19.50	19.50	19.00	20.00
Detroit	19.50	19.50	19.00	20.00
Duluth	20.00	20.00	.....	20.50
Erie, Pa.	19.50	20.00	19.00	20.50
Everett, Mass.	20.50	21.00	20.00	21.50
Hamilton, O.	19.50	19.50	19.00	.....
Jackson, O.	20.25	20.25	19.75	.....
Neville Island, Pa.	19.50	19.50	19.00	20.00
Provo, Utah	17.50	.....	17.00	.....
Sharpsville, Pa.	19.50	19.50	19.00	20.00
Sparrows Point, Md.	20.50	.....	20.00	.....
Swedeland, Pa.	20.50	21.00	20.00	21.50
Toledo, O.	19.50	19.50	19.00	20.00
Youngstown, O.	19.50	19.50	19.00	20.00
Delivered from Basing Points:				
Akron, O., from Cleveland	20.76	20.76	26.26	21.26
Baltimore from Birmingham	21.08	.....	19.96	.....
Boston from Birmingham	20.62	.....	20.50	.....
Boston from Everett, Mass.	21.00	21.50	20.50	22.00
Boston from Buffalo	21.00	21.50	20.50	22.00
Brooklyn, N. Y., from Bethlehem	22.93	23.43	.....	.....
Brooklyn, N. Y., from Bmghm...	22.55	.....	.....	.....
Canton, O., from Cleveland	20.76	20.76	20.26	21.26
Chicago from Birmingham	†19.72	.....	19.60	.....
Cincinnati from Hamilton, O.	19.82	20.58	20.08	.....
Cincinnati from Birmingham	19.44	.....	18.44	.....
Cleveland from Birmingham	19.62	.....	19.12	.....
Indianapolis from Hamilton, O.	21.17	21.77	21.27	.....
Mansfield, O., from Toledo, O.	21.26	21.26	20.76	21.76
Milwaukee from Chicago	20.57	20.57	20.27	21.07
Muskegon, Mich., from Chicago Toledo or Detroit	22.60	22.60	22.10	23.10
Newark, N. J., from Birmingham	21.61	.....	.....	.....
Newark, N. J., from Bethlehem..	21.99	22.49	.....	.....
Philadelphia from Birmingham..	20.93	.....	20.81	.....
Philadelphia from Swedeland, Pa.	21.31	21.81	20.81	.....
Pittsburgh district from Neville Island	Neville base plus 67c, 81c and $1.21 switching charges			
Saginaw, Mich., from Detroit	21.75	21.75	21.25	21.25
St. Louis, northern	20.00	20.00	19.50	.....

Delivered from Basing Points:	No. 2 Fdry.	Malleable	Basic	Bessemer
St. Louis from Birmingham	†19.68	.....	19.50	.....
St. Paul from Duluth	21.94	21.94	.....	22.44

†Over 0.70 phos.

Low Phos.

Basing Points: Birdsboro and Steelton, Pa., and Standish, N. Y., $24.00, Phila. base, standard and copper bearing, $25.13.

Gray Forge		Charcoal	
Valley furnace	19.00	Lake Superior fur.	$22.00
Pitts. dist. fur.	19.00	Do., del. Chicago	25.25
		Lylees, Tenn.	22.50

Silvery†

Jackson county, O., base; 6-6.50 per cent $22.75; 6.51-7—$23.25; 7-7.50—$23.75; 7.51-8—$24.25; 8-8.50—$24.75; 8.51-9—$25.25; 9-9.50—$25.75. Buffalo $1.25 higher.

Bessemer Ferrosilicon†

Jackson county, O., base: Prices are the same as for silveries, plus $1 a ton.

†The lower all-rail delivered price from Jackson, O., or Buffalo is quoted with freight allowed.

Manganese differentials in silvery iron and ferrosilicon, 2 to 3%, $1 per ton add. Each unit over 3%, add $1. per ton.

Refractories

Per 1000 f.o.b. Works

Fire Clay Brick

Super Quality

Pa., Mo., Ky.	$55.00

First Quality

Pa., Ill., Md., Mo., Ky.	$45.00
Alabama, Georgia	$38.00-45.00

Second Quality

Pa., Ill., Ky., Md., Mo.	40.00
Georgia, Alabama	35.00

Ohio

First quality	$40.00
Intermediary	37.00
Second quality	28.00

Malleable Bung Brick

All bases	50.00

Silica Brick

Pennsylvania	$45.00
Joliet, E. Chicago	54.00
Birmingham, Ala.	48.00

Ladle Brick (Dry Press)

Pa., O., W. Va., Mo.	$24.00
Do., wire cut	22.00

Magnesite

Imported dead-burned grains, net ton f.o.b. Chester, Pa., and Baltimore bases (bags) $45.00

Domestic dead-burned grains, net ton f.o.b. Chester, Pa., and Baltimore bases (bags) 40.00

Domestic dead-burned gr. net ton f.o.b. Chewelah, Wash. (bulk) 22.00

Basic Brick

Net ton, f.o.b. Baltimore, Plymouth Meeting, Chester, Pa.

Chrome brick	$45.00
Chem. bonded chrome	45.00
Magnesite brick	65.00
Chem. bonded magnesite	55.00

Fluorspar, 85-5

Washed gravel, duty paid, tide, net ton	$21.50
Washed gravel, f.o.b. Ill., Ky., net ton, carloads, all rail	$18.00
Do., for barge	$19.00

Ferroalloys

Dollars, except Ferrochrome

Ferromanganese, 78-82% tidewater, duty paid	75.00
Do., Balti., base	75.00
Do., del. Pittsb'gh	80.11
Spiegeleisen, 19-20% dom. Palmerton, Pa., spot†	26.00
Do., New Orleans	26.00
Ferrosilicon, 50% freight all., cl.	69.50
Do., less carload	77.00
Do., 75 per cent. Spot, $5 a ton higher.	126-130.00
Silicoman., 2½ carb. 2% carbon, 90.00; 1%,	85.00 100.00
Ferrochrome, 66-70 chromium, 4-6 carbon, cts. lb. del.	10.00
Ferrotungsten, stand., lb. con. del.	1.30- 1.40
Ferrovanadium, 35 to 40% lb., cont.	2.70- 2.90
Ferrotitanium, c. l., prod. plant, frt. allow., net ton	137.50
Spot, 1 ton, frt. allow., lb.	7.00
Do., under 1 ton	7.50
Ferrophosphorus, per ton, c. l., 17-19% Rockdale, Tenn., basis, 18%, $3 unitage	58.50
Ferrophosphorus, electrolytic, per ton c. l., 23-26% f.o.b. Anniston, Ala., 24% $3 unitage	75.00
Ferromolybdenum, stand. 55-65%, lb.	0.95
Molybdate, lb. cont.	0.80

†Carloads. Quan. diff. apply.

Nonferrous

METAL PRICES OF THE WEEK

Spot unless otherwise specified. Cents per pound

	Copper: Electro, del. Conn.	Copper: Lake, del. Midwest	Copper: Casting, refinery	Straits Tin: New York Spot	Straits Tin: London Futures	Lead: New York	Lead: East St. L.	Zinc: St. L.	Aluminum 99%	Antimony: Chinese Spot, N. Y.	Nickel: Cathodes
Sept. 12	9.75	9.87½	9.40	44.37½	43.87½	4.60	4.45	4.85	*19.00	12.50	35.00
Sept. 14	9.75	9.87½	9.40	45.12½	44.62½	4.60	4.45	4.85	*19.00	12.50	35.00
Sept. 15	9.75	9.87½	9.40	44.87½	44.25	4.60	4.45	4.85	*19.00	12.50	35.00
Sept. 16	9.75	9.87½	9.40	44.62½	44.12½	4.60	4.45	4.85	*19.00	12.50	35.00
Sept. 17	9.75	9.87½	9.40	45.25	44.75	4.60	4.45	4.85	*19.00	12.50	35.00
Sept. 18	9.75	9.87½	9.40	46.00	45.60	4.60	4.45	4.85	*19.00	12.50	35.00

*Nominal range 19.00 to 21.00c.

MILL PRODUCTS

F.o.b. mill base, cents per lb. except as specified. Copper brass products based on 9.75c Conn. copper

Sheets

Yellow brass (high)	15.62½
Copper, hot rolled	17.50
Lead cut to jobbers	8.25
Zinc, 100-lb. base	9.50

Tubes

High yellow brass	17.87½
Seamless copper	18.00

Rods

High yellow brass	13.62½
Copper, hot rolled	14.25

Anodes

Copper, untrimmed	15.00

Wire

Yellow brass (high)	15.62½

OLD METALS

Deal. buying prices, cents lb.

No. 1 Composition Red Brass

New York	6.25- 6.50
Cleveland	6.40- 6.75
Chicago	6.12½-6.37½
St. Louis	6.00- 6.50

Heavy Copper and Wire

New York, No. 1	7.87½-8.00
Chicago, No. 1	7.50- 7.75
Cleveland, No. 1	7.25- 7.75
St. Louis, No. 1	7.50- 7.75

Composition Brass Borings

New York	6.00- 6.12½

Light Copper

New York	6.62½- 6.75
Chicago	6.12½-6.37½
Cleveland	6.00- 6.25
St. Louis	6.00- 6.50

Light Brass

Chicago	3.62½-3.87½
Cleveland	3.40- 3.65
St. Louis	3.50- 4.00

Lead

New York	3.75- 4.00
Cleveland	3.75- 3.80
Chicago	3.25- 3.75
St. Louis	3.25- 3.75

Zinc

New York	2.50- 2.75
St. Louis	2.25- 2.75
Cleveland	2.25- 2.50

Aluminum

*Borings, Cleveland	9.50-10.00
*Mixed, cast, Cleve.	13.00-13.25
Mixed, cast, St. L.	13.00-13.50
*Clips, soft, Cleve.	14.50-15.00

SECONDARY METALS

Brass ingot, 85-5-5-5	9.75
Stand. No. 12 alum.	16.75-17.25

Iron and Steel Scrap Prices

Corrected to Friday night. Gross tons delivered to consumers, except where otherwise stated; † indicates brokers prices

HEAVY MELTING STEEL

Birmingham†	11.00-12.50
Boc. d'ck, No. 1, exp.	†12.25-12.50
N. Eng. del. No. 1..	12.75
Buffalo, No. 1	15.00-16.00
Buffalo, No. 2	14.00-14.50
Chicago, No. 1	16.00-16.50
Cleveland, No. 1	15.50-16.00
Cleveland, No. 2	15.00-15.50
Detroit, No. 1	14.50-15.00
Eastern Pa., No. 1..	15.50-16.00
Eastern Pa., No. 2..	14.00-14.50
Federal, Ill.	12.50-13.00
Granite City, R. R.	14.00-14.50
Granite City, No. 2..	12.25-12.75
New York, No. 2	†10.00-10.50
N. Y. d'ck, No. 1,exp.	†12.00
Pitts., No. 1 (R. R.)	19.00-19.50
Pitts., No. 1 (dlr.)..	18.00-18.50
Pittsburgh, No. 2	16.25-16.75
St. Louis, R. R.	14.00-14.50
St. Louis, No. 2	12.50-13.00
Toronto, dealers	7.50
Valleys, No. 1	17.25-17.75

COMPRESSED SHEETS

Buffalo, dealers	14.00-14.50
Chicago, factory	15.00-15.50
Chicago, dealer	14.00-14.25
Cleveland	15.00-15.50
Detroit	14.50-15.00
E. Pa., new mat.	15.00-15.50
E. Pa., old mat.	12.50-13.00
Pittsburgh	18.25-18.75
St. Louis	11.00-11.50
Valleys	16.50-16.75

BUNDLED SHEETS

Buffalo	12.00-12.50
Cincinnati, del.	9.00- 9.50
Cleveland	12.50-13.00
Pittsburgh	16.25-16.75
St. Louis	8.25- 8.75
Toronto, dealers	4.50

SHEET CLIPPINGS, LOOSE

Chicago	10.00-10.50
Cincinnati	8.00- 8.50
Detroit	11.00-11.50
St. Louis	7.50- 8.00

STEEL RAILS, SHORT

Birmingham	12.00-14.00
Buffalo	16.00-17.00
Chicago (3 ft.)	17.25-17.75
Chicago (2 ft.)	18.25-18.75
Cincinnati, del.	16.00-16.50
Detroit	16.50-17.00
Pitts., open-hearth, 3 ft. and less	20.00-20.50
St. Louis, 2 ft. & less	16.00-16.50

STEEL RAILS, SCRAP

Boston district	†11.00-11.50
Buffalo	15.00-16.00
Chicago	16.00-16.50
Pittsburgh	18.50-19.00
St. Louis	15.00-15.50
Toronto, dealers	8.50

STOVE PLATE

Birmingham	8.00- 9.00
Boston, district	†7.50- 7.75
Buffalo	10.00-10.25
Chicago	9.00- 9.50
Cincinnati, dealers..	9.00- 9.50
Detroit, net	9.00- 9.50
Eastern Pa.	12.50-13.00
New York, fdry.	†8.75- 9.25
St. Louis	8.50- 9.00
Toronto, dealers, net	5.50

COUPLERS, SPRINGS

Buffalo	15.50-16.50
Chicago, springs	18.25-18.75
Eastern Pa.	18.00-18.50
Pittsburgh	20.50-21.00
St. Louis	15.00-15.50

ANGLE BARS—STEEL

Chicago	17.50-18.00
St. Louis	15.50-16.00
Buffalo	14.50-15.00

RAILROAD SPECIALTIES

Chicago	17.50-18.00

LOW PHOSPHORUS

Buffalo, billet and bloom crops	15.50-16.50
Cleveland, billet, bloom crops	19.00-19.50
Eastern Pa., crops..	17.50-18.00
Pittsburgh, billet, bloom crops	20.50-21.00
Pittsburgh, sheet bar crops	19.50-20.00

FROGS, SWITCHES

Chicago	15.50-16.00
St. Louis, cut	14.50-15.00

SHOVELING STEEL

Chicago	16.00-16.50
Federal, Ill.	13.00-13.50
Granite City, Ill.	12.25-12.75
Toronto, dealers	6.50

RAILROAD WROUGHT

Birmingham	8.00- 9.00
Boston district	†8.00- 8.25
Buffalo, No. 1	14.00-14.50
Buffalo, No. 2	15.00-16.00
Chicago, No. 1, net..	14.00-14.50
Chicago, No. 2	16.00-16.50
Cincinnati, No. 2	13.50-14.00
Eastern Pa.	15.50-16.00
St. Louis, No. 1	13.00-13.50
St. Louis, No. 2	14.25-14.75
Toronto, No. 1 dlr.	7.00

SPECIFICATION PIPE

Eastern Pa.	13.00-13.50
New York	†10.00-10.50

BUSHELING

Buffalo, No. 1	14.00-14.50
Chicago, No. 1	14.75-15.25
Cinci., No. 1, deal.	11.00-11.50
Cincinnati, No. 2	6.50- 7.00
Cleveland, No. 2	10.50-11.00
Detroit, No. 1, new	14.00-14.50
Valleys, new, No. 1..	16.50-16.75
Toronto, dealers	6.00

MACHINE TURNINGS

Birmingham	6.00- 6.50
Buffalo	7.75- 8.25
Chicago	8.50- 9.00
Cincinnati, dealers..	7.50- 8.00
Cleveland	10.00-10.50
Detroit	9.00- 9.50
Eastern Pa.	9.50-10.00
New York	†6.25- 6.50
Pittsburgh	12.75-13.25
St. Louis	6.00- 6.50
Toronto, dealers	4.00
Valleys	10.75-11.25

BORINGS AND TURNINGS

For Blast Furnace Use

Boston district	†5.00- 5.25
Buffalo	9.25- 9.75
Cincinnati, dealers..	6.50- 7.00
Cleveland	10.50-11.00
Detroit	9.00- 9.50
Eastern Pa.	7.50- 8.00
New York	†4.75- 5.00
Pittsburgh	12.50-13.00
Toronto, dealers	4.00

CAST IRON BORINGS

Birmingham	6.00- 6.50
Boston dist. chem...	†6.25- 6.75
Boston dist. for mills	†5.50- 6.00
Buffalo	9.25- 9.75
Chicago, dealers	9.00- 9.50
Cincinnati, dealers..	6.50- 7.00
Cleveland	10.50-11.00
Detroit	9.00- 9.50
E. Pa.. chemical	10.00-13.00
New York	†6.00- 6.50
St. Louis	5.00- 5.50
Toronto, dealers	5.00

PIPE AND FLUES

Cincinnati, dealers..	8.50- 9.00
Chicago, net	8.00- 8.50

RAILROAD GRATE BARS

Buffalo	11.00-11.50
Chicago, net	10.00-10.50
Cincinnati	8.50- 9.00
Eastern Pa.	12.50
New York	†7.25- 7.75
St. Louis	10.50-11.00

FORGE FLASHINGS

Boston district	†10.00-10.25
Buffalo	14.00-14.50
Cleveland	14.50-15.00
Detroit	13.00-13.50
Pittsburgh	15.50-16.00

FORGE SCRAP

Boston district	†6.50- 7.00
Chicago, heavy	18.00-18.50
Eastern Pa.	14.00

ARCH BARS, TRANSOMS

St. Louis	16.50-17.00

AXLE TURNINGS

Boston district	†7.00- 7.25
Buffalo	11.50-12.00
Chicago, elec. fur.	14.00-14.50
Eastern Pa.	12.50-13.00
St. Louis	9.50- 10.00
Toronto	4.50

STEEL CAR AXLES

Birmingham	12.00-13.00
Boston district	†12.00-12.50
Buffalo	16.00-16.50
Chicago, net	18.00-18.50
Eastern Pa.	20.00-20.50
St. Louis	16.50-17.00
Toronto	8.50

SHAFTING

Boston district	†15.25-15.75
Eastern Pa.	21.00-21.50
New York	†15.50-16.00
St. Louis	15.00-15.50

CAR WHEELS

Birmingham	11.50-12.50
Boston dist. iron	†11.00-11.50
Buffalo, iron	14.50-15.50
Buffalo, steel	16.00-17.00
Chicago, iron	16.00-16.50
Chicago, rolled steel	18.00-18.50
Cincinnati, iron	13.00-13.50
Eastern Pa., iron	17.00
Eastern Pa., steel	18.50-19.00
Pittsburgh, iron	18.00-18.50
Pittsburgh, steel	20.50-21.00
St. Louis, iron	13.50-14.00
St. Louis, steel	16.00-16.50
Toronto, net	8.50

NO. 1 CAST SCRAP

Birmingham	11.50-12.50
Bos. dist. No. 1 mch.	†12.00-12.50
N. Eng., del. No. 2..	†11.25-11.50
N. Eng., del. textile..	12.00-12.50
Buffalo, cupola	13.00-14.00
Buffalo, mach.	14.50-15.50
Chicago, agri. net..	12.00-12.50
Chicago, auto	12.50-13.00
Chicago, mach. net..	13.50-14.00
Chicago, railr'd net..	12.50-13.00
Cinci., mach. cup	13.50-14.00
Cleveland, mach.	16.25-16.75
Eastern Pa., cupola	16.50-17.00
E. Pa., mixed yard..	14.50
Pittsburgh, cupola..	17.00-17.50
San Francisco, del..	13.50-14.00
Seattle	10.00-11.00
St. Louis, No. 1	12.00-12.50
St. L. No. 1, mach.	12.50-13.00
Toronto, No. 1, mach., net	9.00

HEAVY CAST

Boston dist. break..	†10.50-11.00
New England del.	10.00-10.25
Buffalo, break	12.00-12.50
Cleveland, break.	13.00-13.50
Detroit, No. 1 mach. net	13.50-14.00
Detroit, break.	11.50-12.00
Detroit, auto net	13.50-14.00
Eastern Pa.	15.50-16.00
New York breakable	†11.25-11.75
Pittsburgh	15.00-15.50

MALLEABLE

Birmingham, R. R..	12.00-13.00
New England, del..	†16.25-17.50
Buffalo	15.50-16.50
Chicago, R. R.	17.50-18.00
Cincinnati, agri. del.	13.50-14.00
Cleveland, rail	17.50-18.00
Detroit, auto, net	14.50-15.00
Eastern Pa., R. R.	17.50
Pittsburgh, rail	17.00-17.50
St. Louis, R. R.	15.50-16.00
Toronto, net	7.00

RAILS FOR ROLLING

5 feet and over

Birmingham	12.50-13.00
Birmingham	†11.00-11.50
Buffalo	15.00-16.00
Chicago	16.50-17.00
Eastern Pa.	16.00
New York	†12.00-12.50
St. Louis	16.00-16.50

LOCOMOTIVE TIRES

Chicago (cut)	17.50-18.00
St. Louis, No. 1	13.50-14.00

LOW PHOS. PUNCHINGS

Buffalo	15.50-16.50
Chicago	18.00-18.50
Eastern Pa.	18.00-18.50
Pittsburgh (heavy)	19.50-20.00
Pittsburgh (light)	18.50-19.00

Iron Ore

Lake Superior Ore

Gross ton, 51½%

Lower Lake Ports

Old range bessemer	$4.80
Mesabi nonbess.	4.50
High phosphorus	4.40
Mesabi bessemer	4.65
Old range nonbess.	4.65

Eastern Local Ore

Cents, unit, del. E. Pa.

Foundry and basic 56-63% con. (nom.)	8.50- 9.00
Cop.-free low phos. 58-60% (nom.)	10.00-10.50

Foreign Ore

Cents per unit, f.a.s. Atlantic ports (nominal)

Foreign manganiferous ore, 45.55% iron, 6-10% man.	11.00
No. Afr. low phos.	11.00
Swedish basic, 65%	9.50
Swedish low phos.	10.50
Spanish No. Africa basic, 50 to 60%..	nom.
Tungsten, spot sh. ton unit, duty pd.	$15.85-16.00
N. F., fdy., 55%	7.00
Chrome ore, 48% gross ton, c.i.f.	19.50-19.75

Manganese Ore

(Nominal)

Prices not including duty, cents per unit cargo lots

Caucasian, 50-52%	26.00
So. African, 50-52%	27.00
Indian, 50-52%	26.00

Warehouse Iron and Steel Prices

Cents per pound for delivery within metropolitan districts of cities specified

STEEL BARS

Baltimore*	3.10c
Boston††	3.20c
Buffalo	3.10c
Chattanooga	3.46c
Chicago (j)	3.10c
Cincinnati	3.32c
Cleveland	3.00c
Detroit	3.19c
Houston	3.10c
Los Angeles	3.60c
Milwaukee	3.21c-3.36c
New Orleans	3.45c
New York‡ (d)	3.41c
Pitts. (h)	3.05c-3.20c
Philadelphia*	3.15c
Portland	3.60c
San Francisco	3.25c
Seattle	3.80c
St. Louis	3.35c
St. Paul	3.35c-3.50c
Tulsa	3.35c

IRON BARS

Portland	3.50c
Chattanooga	3.46c
Baltimore*	3.10c
Chicago	2.85c
Cincinnati	3.32c
New York‡(d)	3.15c
Philadelphia*	3.15c
St. Louis	3.35c
Tulsa	3.35c

REINFORCING BARS

Buffalo	2.60c
Chattanooga	3.46c
Chicago	2.10c-2.60c
Cleveland (c)	2.10c
Cincinnati	3.25c
Houston	3.25c
Los Angl., cl.	2.45c
New Orleans	3.50c
Pitts., plain (h)	3.05c
Pitts., twisted squares (h)	3.175c
San Francisco	2.45c
Seattle	3.50c
St. Louis	3.35c
Tulsa	3.25c
Young	2.30c-2.60c

SHAPES

Baltimore*	3.10c
Boston††	3.29c
Buffalo	3.35c
Chattanooga	3.66c
Chicago	3.30c
Cincinnati	3.52c
Cleveland	3.41c
Detroit	3.52c
Houston	3.10c
Los Angeles	3.60c
Milwaukee	3.41c
New Orleans	3.65c
New York‡(d)	3.47c
Philadelphia*	3.10c
Pittsburgh (h)	3.25c
Portland (i)	3.60c
San Francisco	3.25c
Seattle (i)	3.65c
St. Louis	3.45c
St. Paul	3.55c
Tulsa	3.60c

PLATES

Baltimore*	3.10c
Boston††	3.31c
Buffalo	3.47c
Chattanooga	3.66c
Chicago	3.30c
Cincinnati	3.52c
Cleveland, ¼-in. and over	3.41c
Detroit	3.52c
Detroit, 3/16-in.	3.85c
Houston	3.10c
Los Angeles	3.60c
Milwaukee	3.41c
New Orleans	3.65c
New York‡(d)	3.50c
Philadelphia*	3.10c
Phila. floor	4.95c
Pittsburgh (h)	3.25c
Portland	3.60c
San Francisco	3.25c
Seattle	3.65c
St. Louis	3.55c
St. Paul	3.55c
Tulsa	3.60c

NO. 10 BLUE

Baltimore*	3.10c
Boston (g)	3.40c
Buffalo	3.72c
Chattanooga	3.46c
Chicago	3.15c
Cincinnati	3.32c
Cleveland	3.21c
Det. 8-10 ga.	3.24c
Houston	3.45c
Los Angeles	3.70c
Milwaukee	3.26c
New Orleans	3.65c
New York‡(d)	3.41c
Portland	3.85c
Philadelphia*	3.20c
Pittsburgh (h)	3.05c
San Francisco	3.60c
Seattle	3.85c
St. Louis	3.40c
St. Paul	3.40c
Tulsa	3.80c

NO. 24 BLACK

Baltimore*†	3.70c
Boston (g)	4.05c
Buffalo	3.35c
Chattanooga*	3.41c
Chicago	3.95c
Cincinnati	4.12c
Cleveland	3.91c
Detroit	4.04c
Los Angeles	4.35c
Milwaukee	4.06c
New Orleans	4.50c
New York‡(d)	3.99c
Philadelphia*†	3.75c
Pitts.**(h)	3.55c-4.85c
Portland	4.20c
San Francisco	4.20c
Seattle	4.50c
St. Louis	4.20c
St. Paul	4.00c
Tulsa	4.85c

NO. 24 GALV. SHEETS

Baltimore*†	3.90c
Buffalo	4.10c
Boston (g)	4.00c
Chattanooga*	3.96c
Chicago (h)	4.65c
Cincinnati	4.82c
Cleveland	4.61c
Detroit	4.82c
Houston	4.50c
Los Angeles	4.40c
Milwaukee	4.76c
New Orleans	4.95c
N. Y.‡ (d)	4.30-4.50c
Philadelphia*†	4.50c
Pitts.**(h)	4.30c-5.55c
Portland	4.60c
San Francisco	5.00c
Seattle	5.10c
St. Louis	4.90c
St. Paul	4.60c
Tulsa	5.20c

BANDS

Baltimore*	3.30c
Boston††	3.40c
Buffalo	3.52c
Chattanooga	3.71c
Chicago	3.40c
Cincinnati	3.57c
Cleveland	3.46c
Detroit, 3/16-in. and lighter	3.49c
Houston	3.35c
Los Angeles	4.20c
Milwaukee	3.51c
New Orleans	4.05c
New York‡(d)	3.66c
Philadelphia*	3.30c
Pittsburgh (h)	3.30c
Portland	4.35c
San Francisco	4.20c
Seattle	4.35c
St. Louis	3.65c
St. Paul	3.65c
Tulsa	3.55c

HOOPS

Baltimore	2.30c
Boston††	4.40c
Buffalo	3.52c
Chicago	3.40c
Cincinnati	3.57c
Det., No. 14 and lighter	3.49c
Los Angeles	5.95c
Milwaukee	3.51c
New York‡(d)	3.66c
Philadelphia*	3.55c
Pittsburgh (h)	3.80c
Portland	5.70c
San Francisco	6.25c
Seattle	5.70c
St. Louis	3.65c
St. Paul	3.65c

COLD FIN. STEEL

Baltimore (c)	3.88c
Boston*	4.05c
Buffalo (h)	3.70c
Chattanooga*	4.28c
Chicago (h)	3.65c
Cincinnati	3.87c
Cleveland (h)	3.65c
Detroit	3.74c
Los Ang.(f) (d)	5.85c
Milwaukee	3.76c
New Orleans	4.45c
New York‡(d)	3.96c
Philadelphia*	3.91c
Pittsburgh	3.50c
Portland (f) (d)	6.30c
San Fran.(f) (d)	5.95c
Seattle (f) (d)	6.25c
St. Louis	3.90c
St. Paul	4.17c
Tulsa	4.80c

COLD ROLLED STRIP

Boston	3.245c
Buffalo	3.39c
Chicago	3.27c
Cincinnati (b)	3.22c
Cleveland (b)	3.00c
Detroit	3.18c
New York‡(d)	3.36c
St. Louis	3.41c

TOOL STEELS

(Applying on or east of Mississippi river; west of Mississippi 1c up)

	Base
High Speed	59½c
High carbon, high chrome	39c
Oil hardening	23c
Special tool	21c
Extra tool	17¾c
Regular tool	14½c

Uniform extras apply.

BOLTS AND NUTS

(100 pounds or over)

	Discount
Chicago (a)	65
Cleveland	70
Detroit	70
Milwaukee	70
Pittsburgh	65-5

(a) Under 100 pounds, 60 off.

(b) Plus straightening, cutting and quantity differentials; (c) Plus mill, size and quantity extras; (d) Quantity base; (e) New mill classif. (f) Rounds only; (g) 50 bundles or over; (h) Outside delivery, 10c less; (i) Under 3 in.; (j) Shapes other than rounds, flats, fillet angles, 3.25c.

Prices on heavier lines are subject to new quantity differentials: 399 lbs. and less, up 50 cts.; 400 to 3999 lbs., base; 4000 to 7999 lbs., 15 cts., under; 8000 to 14,999 lbs., 25 cts. under; 15,000 to 39,999 lbs., 35 cts. under; 40,000 lbs. and over, 50 cts. under; (except Boston).

‡Domestic steel; *Plus quan. extras; **Under 25 bundles; *†50 or more bundles; †New extras apply; ††Base 40,000 lbs., extras on less.

Current Iron and Steel Prices of Europe

Dollars at Rates of Exchange, Sept. 17

Export Prices f. o. b. Ship at Port of Dispatch—(By Cable or Radio)

	British gross tons U. K. ports £ s d	Continental Channel or North Sea ports, metric tons Quoted in dollars at current value	**Quoted in gold pounds sterling £ s d
PIG IRON			
Foundry, 2.50-3.00 Silicon	$15.84 3 2 6*	$13.78	1 15 0
Basic bessemer	15.84 3 2 6*	11.42	1 9 0
Hematite, Phos. .03-.05	19.01 3 15 0	.....	.....
SEMIFINISHED STEEL			
Billets	$29.79 5 17 6	$18.51	2 7 0
Wire rods, No. 5 gage	45.38 8 19 0	35.46	4 10 0
FINISHED STEEL			
Standard rails	$41.83 8 5 0	$43.34	5 10 0
Merchant bars	1.92c 8 10 0	1.16c	3 5 0
Structural shapes	1.86c 8 5 0	1.10c	3 1 6
Plates, †¼ in. or 5 mm.	1.95c 8 12 6	1.52c	4 5 0
Sheets, black, 24 gage or 0.5 mm	2.26c 10 0 0	2.31c	6 10 0††
Sheets, gal., 24 gage, corr.	2.66c 11 15 0	2.49c	7 0 0
Bands and strips	2.09c 9 5 0	1.42c	4 0 0
Plain wire, base	2.20c 9 15 0	1.88c	5 5 0
Galvanized wire, base	2.60c 11 10 0	2.09c	5 17 6
Wire nails, base	2.71c 12 0 0	1.70c	4 15 0
Tin plate, box 108 lbs.	$ 4.75 0 18 9	.....	.....

British ferromanganese $75 delivered Atlantic seaboard, duty-paid. German ferromanganese £9 0s 0d $(43.74) f.o.b.

Domestic Prices at Works or Furnace—Last Reported

	£ s d	French Francs		Belgian Francs		Reich Marks
Fdy. pig iron, Si. 2.5	$19.01 3 15 0(a)	$19.11	290	$15.21	450	$25.36	63
Basic bessemer pig iron	19.01 3 15 0(a)	12.52	190	13.01	385	27.97 (b)	69.50
Furnace coke	5.45 1 1 6	6.85	104	4.63	137	7.65	19
Billets	31.05 6 2 6	30.12	457	19.60	580	38.84	96.50
Standard rails	1.86c 8 5 0	2.01c	671	1.73c	1,150	2.42c	132
Merchant bars	2.11c 9 7 0	1.89c	630	1.05c	700	2.01c	110
Structural shapes	2.12c 9 7 6	1.86c	620	1.05c	700	1.96c	107
Plates, †¼-in. or 5 mm.	2.19c 9 13 9	2.37c	790	1.28c	850	2.32c	127
Sheets, black							
Sheets, galv., corr., 24 ga. or 0.5 mm	2.71c 12 0 0§	2.40c	800‡	1.39c	925‡	2.64c	144‡
Plain wire	3.16c 14 0 0	3.90c	1,300	2.25c	1,500	6.77c	370
Bands and strips	2.20c 9 15 0	3.30c	1,100	1.88c	1,250	3.17c	173
	2.28c 10 2 0	2.21c	735	1.28c	850	2.32c	127

*Basic. †British ship-plates. Continental, bridge plates. §24 ga. ‡1 to 3 mm. basic price. British quotations are for basic open-hearth steel. Continent usually for basic-bessemer steel. a del. Middlesbrough. b hematite. ††Close annealed.

**Gold pound sterling carries a premium of 61.79 per cent over paper sterling.

Bars

Bar Prices, Page 68

Pittsburgh — The disposition of bar users to enter more tonnage on producers' books against the $2 advance for the fourth quarter continues an outstanding development in the merchant bar market. Little of this type of buying, however, can be traced as "speculative," but the increase has served to make many users cease their purchasing methods of for rush and immediate shipment only. Apparently specifications against the present 1.95c, base on hot-rolled bars will be accepted until the end of this month for shipment at mills' convenience, but few producers have announced clearly the deadline on the application of the fourth-quarter market of 2.05c. Alloy steel bars at 2.55c, base, Pittsburgh, are firm on going transactions.

Cleveland—Resumption of activity from auto partsmakers and forge shops, for carbon and alloy steel bars, has increased backlogs in some mills to such an extent that they will be forced to set a deadline shortly for orders shipped at current prices. Jobbers are still having difficulty in replenishing stocks. Requirements of farm equipment manufacturers and roadmaking equipment concerns continue strong, but are overshadowed by recent automotive activity.

Chicago—Bar consumption in the automotive and farm implement industries is tending upward and points to heavier shipments in the near future. Demand is gaining moderately but is attributed more to an increase in consumers' needs than to buying in anticipation of the higher fourth quarter market. Bar iron, along with steel bars, will be advanced $2 a ton Oct. 1 to 1.95c, Terre Haute, Ind., and 2.00c, Chicago. While steel bar deliveries still are extended three to four weeks, users have succeeded in aligning incoming material with their requirements, and pressure for shipment is less insistent.

New York—With the $2 advance in commercial and cold-drawn bars not scheduled to go into effect until Oct. 1, consumers continue to specify liberally in an effort to obtain advantage of present quotations. Deliveries continue well advanced, and producers, consequently, are taking such business as now being offered at current prices either for delivery at their convenience or, where shipping instructions are definitely specified, for delivery not beyond Oct. 15. Bolt and nut makers, who recently reaffirmed their prices for fourth quarter, are understood to be particularly active in the bar market, along with railroads and machine tool builders. Alloy bars are moving briskly.

Philadelphia—With the new prices on commercial steel bars and cold-drawn bars not scheduled to go into effect until Oct. 1, there is still good buying with consumers specifying stocks pending the $2 increase. As sellers are well sold ahead on most specifications, they are taking business at current prices subject to delivery at their convenience as a general proposition. Where buyers specify a definite date for shipment current prices do not hold for material for delivery beyond Oct. 15.

Youngstown, O.—Steel bar buyers continue to urge their necessities upon mills for all sorts of purposes into which plain steel enters. Some of this renewed impulse is laid by the trade to anticipation of the recently announced fourth quarter price advance but more of it is attributed to new business going to users and hence their immediately pressing needs.

Plates

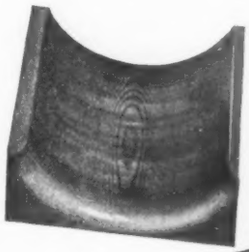
Plate Prices, Page 68

Pittsburgh — Fabricators' plate orders against recently placed contracts held steady through last week and was an encouraging note in a market devoid of fresh plate inquiry of moment. Conclusions have been

INSUROK
BEARINGS

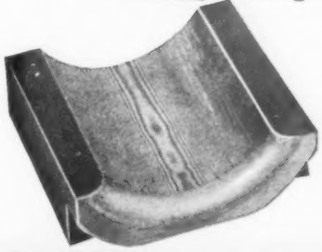
give more years of service per dollar

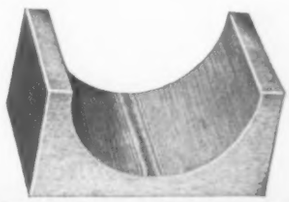
INSUROK Grade C and Grade CG (graphite impregnated) bearings, produced under exclusive Richardson processes, possess unusual qualities and advantages that make them ideal under severe conditions where unfailing service is essential. With a low coefficient of friction, unaffected by changes in temperature, heat-resisting INSUROK bearings are of great strength and density, tough, durable—able to withstand crushing overloads, to cushion the vibration and ease the strains and stresses of continuous operation.



Richardson Bearing Service

Richardson engineers will be glad to give you the benefit of their wide experience and technical knowledge in solving bearing problems. This service is available without cost or obligation.





The RICHARDSON COMPANY

Melrose Park, (Chicago) Ill. Founded 1858 Lockland, (Cincinnati) Ohio
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New York Office: 75 West Street, Phone Whitehall 4-4487

about reached that most railroad car building programs have been concluded for this year in spite of the fact that many repair and rebuilding programs will continue to appear. Marine demand for plates has quieted and in spite of the fact that barge shops here are booked up, no new contracts have been closed on recently. The plate market of 1.90c, f.o.b. Pittsburgh, for shipment over the balance of the year is apparently firm.

Cleveland—While there has been a marked absence in demand for heavy plates, lighter gages have been in active demand from small fabricating shops. Mills are running strong in clearing up old orders of freight car builders. So far this month specifications compare favorable with the similar period in August. The 550 tons of plates for rebuilding a blast furnace at the Corrigan, McKinney division of Republic Steel Corp., Cleveland, has been awarded to W. B. Pollock Co., Youngstown, O.

Chicago—Good activity among car builders is accounting for relatively heavy plate shipments. This group and structural fabricators provide the leading outlet for plates, though sizable tonnages are moving to miscellaneous users. Plate mill operations are enhanced further by partial engagement in the breakdown for sheet rolling. The fourth quarter plate market will continue 1.95c, base.

Boston—Continued strong demand from plate fabricators that has caused deliveries to be pushed forward five to six weeks has brought some cancellations and switching of orders to mills that can fill contracts in a shorter time. In most instances price is still secondary to delivery.

New York—General plate business is less active though railroads are placing tonnages for equipment repairs and are taking prices on routine requirements for fourth quarter. Tank makers have difficulty in obtaining deliveries.

Philadelphia — General plate demand has shown a noticeable decline. While still fairly good, it is not up to the volume of two or three weeks ago. Contributing to recent business have been some releases from the Sun Shipbuilding & Dry Dock Co., Chester, Pa., understood to be for construction of a tanker for the Texas Co. District platemakers regard the New York Shipbuilding Co., Camden, N. J., as the likely recipient of the steamer to be built for the United States Lines, New York, for which at least 15,000 tons of hull steel will be required. As approval of bids submitted on this vessel have to go through several channels there may be some delay in the award. Prices are firm at 2.00c, Coatesville, Pa., or 2.09c, Philadelphia.

Seattle — Important tonnages are to be released and are expected to be up for figures soon. These projects include a pipe line job at Everett, Wash., involving about 6000 tons and 1000 tons are pending in digester and tank work for pulp plants in this state.

Contracts Placed

900 tons, 24 to 40-inch welded steel pipe, water and power department, Los Angeles, to Southwest Welding & Mfg. Co., Los Angeles.

550 tons, mostly plates, rebuilding of blast furnace for Corrigan, McKinney division of Republic Steel Corp., Cleveland, to W. B. Pollock Co., Youngstown, O.

250 tons, 36-inch welded steel pipe, East Bay municipal utility district, Oakland, Calif., to Steel Tank & Pipe Co., Berkeley, Calif.

Contracts Pending

250 tons, 36-inch welded steel pipe, treasury department, San Francisco; bids opened.

150 tons, steel pipe, Conchas dam, Tucumcari, N. Mex.: Griffith Co. and Bent Bros., Los Angeles, low on general contract at $4,583,876.

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QUALITY · DEPENDABILITY

DAMASCUS MANGANESE CASTINGS

Manganese and Alloy Steel Castings One Half to One Thousand Pounds Produced in our modernly equipped foundry from electric furnace steel and heat-treated in automatically controlled gas-fired furnaces.

The DAMASCUS STEEL CASTING CO.
New Brighton, Pa.
(*Pittsburgh District*)

DAMASCUS STEEL CASTINGS
(*Manganese and Alloy*)

Sheets

Sheet Prices, Page 68

Pittsburgh — Specifications for sheets placed last week rose to a new high figure, partly due to the $2 a ton fourth quarter advance in No. 24 hot-rolled annealed, but also due, as in cold-reduced sheets, to insistent present needs. Some smaller sheet mills which cater to the automotive trade are already claiming to be sold out for the balance of the year. In fact, the larger sheet mills are also so well booked that question of delivery is more often than once a focal point in present sheet sales.

Cleveland—Some mills have discontinued booking orders on certain grades, more particularly hot-rolled sheets, for third quarter delivery. Enameling sheets are in greatest demand here but galvanized and electrical have shown continued improvement over the last month. Demand from motor car builders has picked up considerably. While ingot operations continue around 70 per cent of theoretical capacity, all the finishing mills have been running close to capacity for some time now.

Chicago—While sheet demand lately has tended upward, releases from the automotive industry have yet to reach the volume anticipated when additional interests start assembly of 1937 models. October is marked for a sharp revival in automotive sheet needs. Demand elsewhere is steady and mill operations hold near capacity.

Boston—Sheet deliveries still are delayed. Orders are coming in at about the rate established in August.

New York—Leading sheet sellers are now practically out of the market at present prices on grades for which an increase for fourth quarter has been announced—certain ones are completely out, and, as a matter of fact, most consumers of these grades have now become rather well covered. Sheet sellers describe business as somewhat less active, although there apparently has been little or no improvement in deliveries.

Philadelphia—Sheet tonnage has fallen off, following the recent flurry of protective covering on hot-rolled annealed sheets and substantial buying of cold-finished sheets for autobody construction. Some leading sellers are now virtually out of the market on hot-rolled annealed sheets at third quarter prices. This is resulting in some shopping around but for the most part buyers appear fairly well covered. Little or no improvement is noted in deliveries.

Buffalo — Sheet producers expect early buying by the automotive trades and say when that time comes operations will be restored to the 80 to 85 per cent range of the earlier part of this quarter. Sheet production at present is reported unofficially to be off 10 to 15 points from the best peak of the year. A good fourth quarter is anticipated.

St. Louis—Specifications for steel sheets placed during the past week or ten days have reached the highest levels in recent months. This is attributed to heavy consumption, urgent need of the material and the advance of $2 on certain items, effective Oct. 1. Buying is in fair volume, and well diversified, though contracting for fourth quarter is below expectations.

Youngstown, O.—Sheet mills are speeding up operating rates against a backlog of mill orders that has continued to grow almost with each succeeding day for the past fortnight. Added to the requirements urged from miscellaneous sources now are filtering in the preliminary needs from early builders of 1937 automobiles.

Cincinnati — Sheet demand for fourth quarter shipment is active, presaging a backlog of considerable proportions by Oct. 1. Rolling

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schedules are near capacity to avoid, as far as possible, extended deliveries on the third quarter contracts against which books have already been closed.

Transportation

Track Material Prices, Page 69

Railroad buying is relatively light but programs are being outlined that are expected to bring large tonnages to steelmakers later in the year. The Wabash and Central of Georgia have covered 5000 tons of rails each and the latter a large assortment of track fastenings. Birmingham Southern has bought nine diesel-electric locomotives and St. Louis Southwestern is in the market for five steam locomotives.

Western Pacific plans to relay nearly 500 miles of track with 100 and 110-pound rails and also to buy additional locomotives and cars and put on an extensive repair program.

Pittsburgh & Lake Erie specifies in its recent inquiry for 150 all-steel box cars that second-hand underframes, trucks and steel ends, but new steel superstructures be used.

Locomotives Placed

Birmingham Southern, subsidiary of Tennessee Coal, Iron & Railroad Co., five 900-horsepower diesel-electric locomotives, to American Locomotive Co., New York.

United Fruit Co., five small locomotives, to Baldwin Locomotive Co., Philadelphia.

Rail Orders Placed

5000 tons, 90-pound rails, 250,000 tie plates, 1600 kegs bolts, 3000 kegs spikes, to Tennessee Coal, Iron & Railroad Co., Birmingham, Ala.

Wabash, 5000 tons, to Carnegie-Illinois Steel Corp., Inland Steel Co., Bethlehem Steel Co.

Locomotives Pending

St. Louis Southwestern, five locomotives; bids asked.

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were built into the above display to convey the sales message of United States Steel.

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Pipe

Pipe Prices, Page 69

Pittsburgh—Likelihood that the line pipe order for the Godfrey Cabot Co., Boston, will develop to the contract stage shortly is indicated through the proximity of closed weather conditions which would necessarily carry the project over into 1937. Specifications for tubular products the past week were slightly less than two weeks ago. All pipe discounts are without change. Manufacturers Light & Heat Co., Pittsburgh, will build a small 8-inch gas line across the Monongahela river in Monongahela county.

Cleveland—Demand for standard wrought pipe, going into industrial extensions and repair work, has declined slightly. This condition has given mills an opportunity to diminish backlogs, which have been extended 8 to 10 days. Requirements for cast iron pipe have recently improved with the increased activity in W. P. A. work. However, specifications continue to come in for small tonnages.

Chicago—Cast pipe awards are light and made up principally of small individual lots. Chicago is in the market for 100 tons of fittings, while Midland, Mich., is taking bids on 500 tons of various sizes of pipe. Chicago sanitary district will take bids Oct. 1 on an unstated tonnage for a local sewage disposal plant.

Birmingham, Ala.—Steady operating schedules are resulting in active production of cast pipe, and indications point to continued production at the present rate for some little time. A few federal-aid projects, requiring pipe and fittings in their installations, are noted.

Boston—Cast pipe demand is ac-

tive. Warren Pipe & Foundry Corp. booked an order for 325 tons of 12-inch pipe for Newton, Mass., while A. Grande, Roslindale, Mass., submitted low bid for 10,000 feet of 48-inch and 250 feet of 36-inch steel pipe for installation in the Chelsea and Everett districts.

New York—Shops are fairly busy turning out work on orders on the books, and no new contracts for heavy tonnages have been taken. Approximately 700 tons, pending for some time, was awarded to contractors last week. Some private work, all of small lots, was placed last week, and inquiries are coming out somewhat slowly.

San Francisco—National Cast Iron Pipe Co. booked 122 tons of 6 to 10-inch pipe for Whittier, Calif. Vallejo, Calif., has opened bids on 115 tons of small sized pipe. California Pipe & Supply Co. was awarded 351 tons of 1 to 6-inch grade A plain and seamless steel pipe for the gas department, Long Beach, Calif.

Seattle — Demand for cast iron goods is slow and no important projects are pending. However, the potential tonnage is of sizable proportion as many municipalities have planned improvements and extensions with federal aid. Seattle opened bids Sept. 17 for furnishing 59,000 feet of galvanized wrought iron and steel pipe.

Cast Pipe Placed

400 tons, Westchester sanitary sewer commission, White Plains, N. Y., to Empire Construction Co., New York, and Frank Bracalello, Jamaica N. Y.
325 tons, 12-inch, Newton, Mass., to Warren Foundry & Pipe Corp., Phillipsburg, N. J.
165 tons, state hospital, Kings Park, N. Y., to De Lisso Construction Co., Jamaica, N. Y.
160 tons, 30-inch class B, Trenton, N. J., procurement division, treasury department, Newark, N. J., to Bonded Supply Co.
122 tons, 6 to 10-inch, Whittier, Calif., to National Cast Iron Pipe Co., Birmingham, Ala.

Cast Pipe Pending

500 tons, Midland, Mich.
115 tons, Vallejo, Calif.; bids opened.
100 tons, fittings, Chicago; bids Sept. 23.
100 tons, 5000 feet 8-inch, 1000 feet 6-inch; Fall River, Mass.

Steel Pipe Pending

10,000 feet, 48-inch, and 250 feet of 36-inch steel pipe, for installation in the Chelsea and Everett districts of the metropolitan district water supply commission; A. Grande, Roslindale, Mass., low.

Strip

Strip Prices, Page 69

Pittsburgh—Prices on high carbon cold-rolled strip steel have been advanced for fourth quarter, with the following changes being announced last week: on carbon 0.51 to 0.75 the fourth-quarter market will be 3.70c, Pittsburgh or Cleveland, and 3.90c, Worcester, Mass., an advance of 25 cents from present markets; on 0.76 to 1.00 carbon, 5.45c, Pittsburgh or Cleveland, and 5.65c, Worcester, Mass., an advance of 50 cents; over 1.00 carbon, 7.50c, Pittsburgh or Cleveland, and 7.70c, Worcester, Mass., an advance of $1. The strip market, which is continuing active, still features more spot buying for immediate shipment than forward commitments. A change in pickling and oiling extras such as announced on No. 24 gage hot-rolled annealed sheets is being extended to hot-rolled strip.

Cleveland—Specifications for hot and cold-rolled strip have shown a gradual increase since the first of the month. Auto partsmakers have come back into the market and electrical equipment manufacturers continue to show a high rate of activity. Most mills have made little headway in reducing backlogs, that are now four

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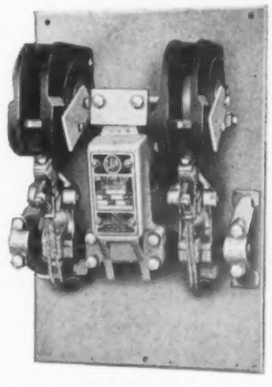
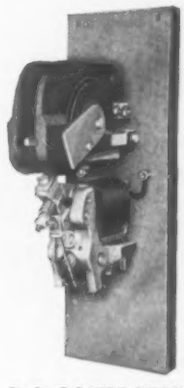


A-C CONTACTOR



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AUTOMATIC CONTROL *for* CRANES • MILL DRIVES *and* MACHINERY
BRAKES • LIMIT STOPS *and* LIFTING MAGNETS.

weeks on hot-rolled and five to six weeks on cold-rolled.

Chicago—Demand is steady, showing only minor fluctuations from the rate a month ago. Additional automotive releases are being received, and heavy shipments are scheduled to start by early October. Producers are able to give fairly prompt delivery of hot-rolled strip, with shipments of cold-rolled material deferred about four weeks. Fourth quarter books are open at unchanged prices.

Boston—Sales of cold-rolled strip for the first half of September exceeded those during the first half of August. The outlook for the remainder of the month looks bright. No announcement has been made on fourth quarter prices for the lower gages, although an increase in the price of strip for specialties is expected.

Youngstown, O. — Lengthening backlog of strip steel specifications continues to give a feeling of satisfaction to mill operators. Narrower widths lead both in hot and cold-rolled; but wider strip seems about to undergo similar pressure for automotive use.

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DETROIT

Philadelphia—Narrow strip is moving sluggishly. Requirements of this district are no longer what they used to be, and it appears that such requirements as still arise are fairly well taken care of for the present. Prices are unchanged, quotations having been reaffirmed or next quarter.

Wire

Wire Prices, Page 69

Pittsburgh — Inasmuch as the present reduced prices on standard wire nails are available to consumers only over the balance of this month, considerable trade interest is centering on the market for fourth quarter. It is expected that some price declaration will be made late this week on both merchant and manufacturing items. Apparently realizing that a significant change may come for fourth quarter, a number of users of merchant wire products have been driven to anticipate their specifications over the past week. The consequence has been that many producers have become booked up to a heavier extent and it is expected that this condition will be accentuated over the balance of September.

Cleveland—No definite price policy has yet been announced for fourth quarter, but such an announcement will probably be made next week. General requirements continue at the rapid pace set through August. Manufacturing wire is in greatest demand, in view of the resumption of activity in the automotive field. Little change has been noticed in the requirements for merchant wire products.

Chicago — September business to date has been about equal to that a month ago, but heavier automotive releases are expected to result in an upturn within the next week or two. Price revisions in wire rods and wire products on September bookings have had no appreciable effect on demand. Opening of fourth quarter books and announcement of prices for that period are deferred.

New York—The price situation for fourth quarter on wire is still unclarified. Some believe the $2 reduction on heavier wire rods will be eliminated in official process. The same does not apply to wire nails, the recent reduction not having stimulated buying.

D. H. Skeen & Co., Chicago, managed by Kenneth Williams, formerly in charge of the industrial engineering sales for H. M. Byllesby & Co., has been appointed sales representative by the George P. Reintjes Co. for the sale of its supported furnace walls and arches in the Chicago area.

Shapes

Structural Shape Prices, Page 68

New York—The structural market was active last week, a sizable tonnage being placed on the pending lists with general contracts being let or bids to be taken soon, while considerable small work is being booked by fabricators. Lettings were featured by the 6000 tons for the West Side elevated highway extension that went to American Bridge Co., through Del Balso Construction Co., New York.

Pittsburgh—American Bridge Co., Pittsburgh, entered a contract last week for 5800 tons of fabricated structural steel in roof coverings for the New York Central railroad tracks from West Ninety-eighth to 111th streets, New York, and Jones & Laughlin Steel Corp., 630 tons for a state highway bridge in Wilkinson county, Mississippi. Structural inquiry is featuring 2000 tons for a state armory at Teaneck, N. J., and smaller projects.

Cleveland — Mills are operating close to capacity with deliveries well extended. This condition has caused considerable concern among fabricators, who having been awarded jobs on the assumption of making prompt deliveries, now find it increasingly difficult to get steel from mills. Most of the tonnage placed is from private sources, averaging well under 100 tons. Bids are due Sept. 24 on decorating warehouse building, involving 1000 tons, for the Libbey Glass Mfg. Co., Toledo, O. The mill building for the Elyria Foundry Co., Elyria, O., has been postponed indefinitely.

Boston—Structural shape contracts awarded last week in this district totaled 7678 tons. Of this total, 7000 tons is represented by an award officially booked by Bethlehem Steel Co. for the Connecticut river bridge, Hartford, Conn.

Philadelphia — An increasing amount of bridge work, including a number of jobs for flood replacements in this state is stimulating structural activity here. At present more than 30 projects, ranging from 15 to several hundred tons, are under contemplation and several of these are being actively figured this month. Last Friday bids were opened on three Pennsylvania state bridges which alone involved 750 tons. In New Jersey PWA grants, amounting to $2,260,000, have been allowed, which will permit work to start soon on 15 grade crossing eliminations, costing more than $5,000,000. The state highway commission, Trenton, N. J., has just issued specifications for three bridges in Northern New Jersey, totaling 2030 tons.

The du Pont interests, Wilmington, Del., have 1000 tons actively pending for a gasoline plant at Eaton Rouge, La., and before this year is over the Philadelphia board of education is expected to bring out specifications for three schools, requiring close to 12,000 tons of shapes and more than 1000 tons of reinforcing bars. It is understood, however, that funds are not yet available for all three schedules, so there may be some delay.

St. Louis—Fabricators of structurals report sharp falling off in volume of orders. However, plants continue to operate at about 75 per cent of capacity, and this rate, supported by backlogs, will continue through September.

San Francisco — Shape awards aggregated 2051 tons and brought the total for the year to 134,302 tons as

Shape Awards Compared

	Tons
Week ended Sept. 18	42,737
Week ended Sept. 11	19,305
Week ended Sept. 4	11,129
This week, 1935	18,522
Weekly average, 1935	17,081
Weekly average, 1936	23,129
Weekly average, August	28,225
Total to date, 1935	605,850
Total to date, 1936	878,908

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compared with 80,490 tons for the corresponding period in 1935. Special interest centers around opening of bids on the federal building and the Union station, Los Angeles, involving a total of close to 30,000 tons.

Shape Contracts Placed

7000 tons, Connecticut river bridge, Hartford, Conn., to Bethlehem Steel Co., Bethlehem, Pa.

6000 tons, extension West Side highway, New York, to American Bridge Co.; through Del Balso Construction Co., New York, general contractor.

5800 tons, roof covering over tracks, for New York Central railroad, West Ninety-eighth to 111th streets, New York, to American Bridge Co., Pittsburgh.

2670 tons, Rockland state hospital, Orangeburg, N. Y., to Bethlehem Steel Co., Bethlehem, Pa.

1775 tons, hospital building, Jersey City medical center, Jersey City, N. J., to Lehigh Structural Steel Co., Allentown, Pa.

1650 tons, sewage treatment works, Wards Island, N. Y., to Harris Structural Steel Co., New York.

1260 tons, gymnasium for United States military academy, West Point, N. Y., to Bethlehem Steel Co., Bethlehem, Pa.

1020 tons, butterfly sheds, Union station, Los Angeles, to Consolidated Steel Corp., Los Angeles.

1020 tons, Fisk street station, Commonwealth Edison Co., Chicago, to Midland Structural Steel Co., Chicago.

887 tons, bridge, St. Louis Park, Minn., to American Bridge Co., Pittsburgh.

780 tons, state highway bridge, Payne county, Oklahoma, to Capitol Steel & Iron Co.

703 tons, sheet piling, bureau of reclamation, three parcels, Potholes, Calif., to Bethlehem Steel Co., Bethlehem, Pa.

630 tons, warehouse addition, government printing office, Washington, awarded through Charles H. Tompkins, that city, to Bethlehem Steel Co., Bethlehem, Pa.

600 tons, crossing elimination, East St. Louis, Ill., to Bethlehem Steel Co., Bethlehem, Pa.

580 tons, state highway bridge, Canadian county, Oklahoma, to Capitol Steel & Iron Co.

550 tons, state highway bridge, Hardtner county, Kansas, to Patterson Steel Co., Tulsa, Okla.

540 tons, state highway bridge, Pierce county, Washington, to Pacific Car & Foundry Co., Seattle.

510 tons, state highway bridge, Sangamon county, Illinois, to Mississippi Valley Structural Steel Co., Decatur, Ill.

490 tons, 40-foot curb angles, procurement division, treasury department.

490 tons, bridge WPGH 42A, Brown county, South Dakota, to American Bridge Co., Pittsburgh, and Omaha Steel Works, Omaha, Nebr.

410 tons, 24 steel dredge pontoons, U. S. engineers, St. Paul, to Treadwell Engineering Co., Easton, Pa.

400 tons, store, Milwaukee, for W. F. Woolworth Co., to Wisconsin Bridge & Iron Co., Milwaukee.

375 tons, building for General Brewing Co., San Francisco, to Western Iron Works, San Francisco.

350 tons, state highway bridge, Oklahoma county, Oklahoma, to J. B. Klein Iron Foundry Co., Oklahoma City, Okla.

340 tons, extension to power station, Rivesville, Va., to Fairmount Mining Machinery Co.

325 tons, Cicero avenue crossing elimination, Chicago, to American Bridge Co., Pittsburgh.

320 tons, store building, Miami, Fla., to Ingalls Iron Works, Birmingham, Ala.

310 tons, two steel oil barges, U. S. engineers, St. Paul, to Charles Hegewald Co. New Albany, Ind.

303 tons, Carson Estate, Dominguez Estate and Centinella avenue bridges for United States engineer office, Los Angeles, to Bethlehem Fabricators Inc., Bethlehem, Pa.

300 tons, Ballentine brewery, Newark, N. J., to Breen Iron Works, Newark.

290 tons, asbestos cement plant, East Chicago, Ind., to Joseph T. Ryerson & Sons Co., Chicago.

285 tons, WPGM 432A, Memphis, Tenn., to Virginia Bridge & Iron Works, Roanoke, Va.

280 tons, high school, Stamford, New York, to Gray Steel Corp.

275 tons, Capitol bus terminal, Fifty-first street, New York, to Dreier Steel Co., New York.

250 tons, bridge in Pulaski county, Missouri, to Cunningham, Condron & Lemon, general contractors.

215 tons, miscellaneous spans, Clear Creek county, Colorado, to Midwest Steel & Iron Co., Denver.

200 tons, store, 428 South Hill street, Los Angeles, to Bethlehem Steel Co., Bethlehem, Pa.

185 tons, building alteration, Kent & Flushing, Brooklyn, N. Y., to Eglesston Bros. & Co., Long Island City, N. Y.

166 tons, Central avenue bridge for United States engineer office, Los An-

Behind the Scenes with STEEL

Long May She Wave

SPINNING the four-color airplane dial of one of the new model all-wave radio receivers, with ultra ultra audio frequency resonators and double-coupled antenna circuit—and, of course, steel tubes—a person quickly feeels his own insignificance and impotence in the face of a world coated with a thick layer of air in which astounding things are happening.

For instance, in London, a staid Britisher in clipped phrases and perfect enunciation is reciting the latest Rugby scores to a waiting world, as a nearby clock tolls the hour of 5 a. m. In Berlin an excited Teuton is pouring out a volley of news dispatches, in Spanish, for the benefit, he says, of the Central American states. And probably in Madrid, a bloody general is gasping out similar "news flashes" in German, for the benefit of the USSR.

Somewhere east of New Orleans an airplane pilot chats nonchalantly with an airport, finding the ceiling and visibility apparently satisfactory. And in Lansing, Mich., it seems the local police would like Squad Car No. 26 to investigate a disturbance on East Main street, while an amateur at Maple Heights, O., calls pleadingly for "CQ-CQ-CQ-CQ." People in Havana, Cuba, are dancing to a mean rhumba, but more people in Italy are being instructed about the latest warnings from Il Duce.

Great thing—radio. We think it's here to stay!

* * *

High Gear

NOT that our opinion carries any great weight, but we wish more conventions were patterned after that recently held by the American Gear Manufacturers association, on board the S. S. SEEANDBEE, enroute from Chicago to Mackinac and Cleveland (see p. 60). It was just one, big happy family, from what we hear, with everybody wearing paper hats, tooting horns and breaking down the old reserve in general.

The sun and wind lent their assistance to make the trip a comfortable and smooth one. It might have been pretty bad if a high sea had suddenly been kicked up right in the midst of an involved technical paper, and the author and audience had been compelled to hasten railward.

President E. S. Sawtelle of the AGMA was bothered a little by people continually shouting, "Where's Elmer," and Captain McPhail was late for the Captain's dinner, but outside of that there were no untoward incidents, according to Editor Erle Ross who made the trip. Didn't even sight an enemy submarine, he says.

* * *

Added Attraction

HARD on the heels of the iron and steel engineers' annual roundup which convenes in Detroit this week is the National Metal Congress and Exposition, in Cleveland, Oct. 19-23. The Oct. 12 issue of STEEL will present full advance particulars of this great metal event, as well as an original editorial effort to be titled, "Alloys in Action." Beyond saying it would be "some stuff", the editors refuse to divulge details of the latter. Somebody must have let the dope out, though, if the rate at which advertising reservations for this section are coming in is any criterion. The composing room is being piled high with advertisers' plates, all carefully wrapped in pink cellophane to avoid scratches. They tell us it's almost dangerous to walk around there these days. Any minute a tall pile of these plates may fall right over on you. Tsk-tsk!

—SHRDLU

INQUISITIVE CAMERA DEPT.—XVI

CHARLES J. STARK, president of the Penton Publishing Co., publisher of STEEL, *and for ten years editor of* STEEL'S *predecessor,* Iron Trade Review. *A Wooster, O., boy who made good, he is a former newspaperman and recently headed Associated Business Papers Inc.*

geles, to Consolidated Steel Corp., Los Angeles.

150 tons, structural steel for naval supply depot, San Diego, Calif., to Bethlehem Steel Co., Bethlehem, Pa.

150 tons, dormitory, Radcliffe college Cambridge, Mass., to New England Structural Steel Co. Boston; through McCutcheon Co., Boston.

150 tons, Lenox Hill hospital addition, New York, to Harris Structural Steel Co., New York; through Hegeman-Harris Co., New York.

150 tons, Quincy bridge grade crossing, to Bethlehem Steel Co., Bethlehem, Pa.; through Coleman Bros Corp., Boston.

145 tons, Consolidated Gas Electric Light & Power Co., five storage tanks, Annapolis, Md., to Bartlett Hayward Co., Baltimore.

140 tons, shapes, federal housing project, Camden, N. J., to Bethlehem Steel Co., Bethlehem, Pa.; this, in addition to more than 900 tons of reinforcing bars recently reported placed with this company for this project.

140 tons, state highway bridge, Lynnfield, Mass., to Bethlehem Steel Co., Bethlehem, Pa.; through Alfred H. Lewis Andover, Mass.

138 tons, overpass, Mansfield, Mass., to Bethlehem Steel Co., Bethlehem, Pa., through Coleman Bros. Corp., Boston.

135 tons, auto show room, 1730 Broadway, New York, to Grand Iron Works Inc., New York.

130 tons, bridge, Sweetwater county, Wyoming, to unnamed interest.

125 tons, bridge No. 302, Oconto county, Wisconsin, to Lakeside Bridge & Steel Co., Milwaukee.

120 tons, bridge WPGM 418, Pennington county, South Dakota, to Omaha Steel Works, Omaha, Nebr.

120 tons, east portal, Metropolitan water district, Los Angeles, to Pacific Iron & Steel Co., Los Angeles.

105 tons, state overhead crossing, Mullens, W. Va., to Roanoke Iron & Bridge Co., Roanoke, Va.

105 tons, bridge, WPGH 497E, Ashland county, Wisconsin, to Lakeside Bridge & Steel Co., Milwaukee.

100 tons, steel partitions, specification 821-D, Boulder dam, Nev., to unnamed interest.

100 tons, bridge, Everett, Mass., for Boston Elevated railway, Boston, to New England Structural Steel Co.

Shape Contracts Pending

4600 tons, toll bridge between Easton, Pa., and Phillipsburg, N. J., specifications expected out early in October, with plans on substructure, requiring 110 tons of reinforcing bars, scheduled to come out before the close of September.

2000 tons, state grade crossing elimination, Buffalo; bids postponed from Sept. 15 to Sept. 25.

2000 tons, state armory, Teaneck N. J.

1860 tons, state bridge, Deerfield-Sunderland, Mass.; bids Sept. 25.

1725 tons, department of water and power, Los Angeles.

1400 tons, Belleville turnpike bridge Kearny, N. J.; bids opened at Trenton, N. J.

1000 tons, MacGregor bridge, Manchester, N. H.

1000 tons, tetraethyl gasoline plant for E. I. du Pont de Nemours & Co., Wilmington, Del., for erection at Baton Rouge, La.; bids asked. This company, as noted in a recent issue, closed on 800 tons of structural steel for a cellophane plant near Richmond, Va.

900 tons, dam spillway and intake gates, Sheffield, Ala.

815 tons, steel truss bridge, Juniata county, Pennsylvania; Whittaker & Diehl Co., Harrisburg, Pa., low at $143,876.24 on Sept. 4 state opening. Included, 82 tons of plain steel bars.

760 tons, state highway bridge, Hartford, Conn.

750 tons, three state bridges in Bedford, Franklin and Indiana counties, respectively, Pennsylvania; bids opened Sept. 18; the bridge in Indiana county will require 350 tons of structural steel and those in Bedford and Franklin counties, 200 tons each.

600 tons, Brooklyn state hospital; Cay Construction Co., Brooklyn, N. Y., low bidder.

600 tons, Hudson-Midtown tunnel; G. A. M. Construction Co., Queens, N. Y., low bidder.

600 tons, library building, Howard university, Washington; bids postponed until Sept. 29.

550 tons, Raritan overpass bridge, South Amboy, N. J.; bids taken Sept. 28 at Trenton, N. J.

500 tons, public school No. 162, New York.

500 tons, state highway bridge, Perth Amboy, N. J.

500 tons, department store for Frederick Loeser, Brooklyn, for Garden City, N. Y.; bids Sept. 24.

450 tons, two bridges, Barbers crossing, Worcester, Mass.; bids Sept. 25.

440 tons, building, for Allied Family Corp., New York.

400 tons, two bridges, Avenell and Iseler, N. J., for Pennsylvania railroad, New York; bids Sept. 24.

375 tons, state highway bridge, Cicero avenue, Chicago.

NUMBER NINE OF A SERIES

THE METALLOGRAPHER

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350 tons, junior high school, Ogdensburg, N. Y.
328 tons, state bridge over Nashua river, Clinton, Mass.; bids Sept. 25.
283 tons, four underpass bridges, Saugus, Mass.; bids Sept. 25.
280 tons, bridge, Wallingford, Vt.; Joseph P. McCabe, Boston, is low bidder
275 tons, state highway bridge, Kalamazoo, Mich.
250 tons, apartment for Lockrell Holding Co., Mt. Vernon, N. Y.
247 tons, New county road bridge, Biddeford, Me.; bids Sept. 23 in Augusta, Me.
234 tons, middle bridge, Dresden, Me.; bids Sept. 23 in Augusta, Me.
203 tons, through truss bridge, Erie county, Pennsylvania; Charles H. Fry Construction Co., Erie, Pa., low bidder at $49,787.91 on Sept. 4 opening. Included, 30 tons of plain steel bars.
200 tons, bridge Limington-Standish, Me.; bids Sept. 23 in Augusta, Me.
194 tons, steel truss bridge, Tioga county, Pennsylvania; C. L. Johnson & Sons, Mansfield, Pa., low bidder at $42,399.05 on Sept. 4 bid. Included, 26 tons of plain steel bars.
182 tons, highway underpass, Lancaster county, Pennsylvania; Harry T. Campbell Sons Co., Towson, Md., low bidder at $216,569.21 on Sept. 4 opening. Included, 73 tons of plain steel bars.
175 tons, naval militia armory, Camden, N. J., Belmont Iron Works, Eddystone, Pa., low on general contract.
170 tons, Ballseye bridge, Bangor, Me.; bids Sept. 23 in Augusta, Me.
169 tons, two bridges, Maleden-Revere, Mass.; bids Sept. 25.
135 tons, Jackson street bridge, United States engineer office, Los Angeles; Consolidated Steel Corp., Los Angeles, low.
130 tons, bridge, North Bergen, N. J.; bids opened at Trenton, N. J., Oct. 5.
125 tons, Glenoaks boulevard bridge, United States engineer office, Los Angeles; Consolidated Steel Corp., Los Angeles, low.
122 tons, state bridge, Cocasset street, Foxboro, Mass.; bids Sept. 25.
112 tons, state highway bridge, Millbury-Sutton; bids Sept. 25.
100 tons overpass, Sharon, Mass.; bids Sept. 25.
100 tons, Calvert Theater building, Washington; bids opened Sept. 22.
100 tons, fairgrounds bridge, Springfield, Vt.; bids taken Sept. 15.
Unstated tonnage, Postoffice, Plymouth, N. H.; D'Amore Construction Co., Boston, is general contractor.

Reinforcing

Reinforcing Bar Prices, Page 69

New York—Lettings of concrete reinforcing bars on identified projects totaled 200 tons last week, this amount coming from the Williamsburg slum clearance in Brooklyn. In addition, 2000 tons for this project is still pending. Approximately 1300 tons was added to the pending backlog last week, all of the projects emanating from New Jersey.

Pittsburgh — Eleven mills submitted bids recently on 3575 tons of steel reinforcing bars in 1, 1⅛ and 1¼-inch squares for the Fort Peck dam, Wiota, Mont. Award was made last week to Republic Steel Corp., Cleveland, bidding $170,857.12, Buffalo. State of Pennsylvania has inquiries out for closing Oct. 2 on 41,453 pounds of plain steel bars for Bucks county, 17,154 pounds for Union-Lycoming counties, and 12,543 pounds for Sullivan county. The market on new billet quality bars for reinforcing purposes continues to show some wide deviation from the official 2.05c, Pittsburgh, price.

Cleveland — Business in concrete reinforcing steel bars holds at a moderate rate here but most requirements are considerably under 100 tons. Shipments against contracts remain heavy, and some feel that they will continue active into fourth quarter. Much mesh material is used in road repair work. Pending business includes an elevator construction for the Fairchild Milling Co., Cleveland, on which bids were recently taken. Prices remain firm but there has not been enough heavy tonnage for a real test.

Chicago—Shipments of concrete bars against contracts hold near the active rate of the past 60 days. New business, however, is lagging behind shipments, though a fair volume is pending. State road work is lagging and a relatively large amount of construction has yet to come up for bids in Illinois. Private building is made up mostly of small lots.

Boston—Lettings of concrete bars last week were heavy, the identified awards totaling 1391 tons. The largest order, involving 700 tons for the Connecticut river bridge, Hartford, Conn., was split, 450 going to Jones & Laughlin Steel Corp., and 250 tons to Bethlehem Steel Co. Several projects involving 100 tons or less are out for bidding soon, and many smaller jobs are on inquiry, provisions of the Robinson-Patman act said to have stiffened prices at base 2.10c, Buffalo, or 2.46c, Boston.

Philadelphia—No change in fourth quarter prices will be made, according to leading trade interests; a week ago an increase was regarded as pos-

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Concrete Awards Compared

	Tons
Week ended Sept. 18	8,834
Week ended Sept. 14	3,827
Week ended Sept. 4	3,935
This week, 1935	14,648
Weekly average, 1935	6,862
Weekly average, 1936	6,670
Weekly average, August	7,011
Total to date, 1935	260,958
Total to date, 1936	253,491

sible and as a result there was some protective covering. The possibility of this increase also tended to firm up the going market, which had lagged behind the official quotations, and some of this strength continues in evidence. Trading over the past several days has been rather negligible, however, with few outstanding projects pending.

San Francisco — So far no announcement has been made by Pacific Coast producers of mild steel and reinforcing steel bars regarding fourth quarter prices. If eastern prices are raised most consumers look for advances from western makers. The sales organizations of most mills are now hot after production managers for deliveries and a backlog of bar and sheet business is on the books.

Reinforcing Steel Awards

3575 tons, for Fort Peck dam, Wiota, Mont., to Republic Steel Corp., Cleveland, at $170,587.12.

700 tons, Connecticut river bridge, Hartford, Conn., to Jones & Laughlin Steel Corp., Pittsburgh, and Bethlehem Steel Co., Bethlehem, Pa.

600 tons, buildings for Hollenbeck high school, Los Angeles, to unnamed interest.

555 tons, Los Angeles river bridge at Atlantic avenue, Los Angeles, to unnamed interest.

458 tons, treasury department, Los Angeles, schedule 13,931, list 1741, to California Hardware Co., Los Angeles.

450 tons, housing project, Cambridge, Mass., to Morrison-Stevens Co., Boston; through John Bowen Inc., Boston.

394 tons, main building new high school, Sacramento, Calif., to Concrete Engineering Co., San Francisco.

300 tons, Los Feliz boulevard school, Los Angeles, to Blue Diamond Corp., Los Angeles.

280 tons, bureau of reclamation, invitation A 33,541-A and A 33,542-A, Pomona, Wash., to Bethlehem Steel Co., Bethlehem, Pa.

274 tons, Richmond sewer tunnel, San Francisco, to Truscon Steel Co., San Francisco.

217 tons, specification 185-G, water and power department, Los Angeles, to Concrete Engineering Co., Los Angeles.

200 ton, Williamsburg slum clearance (Ten Eyck houses), Brooklyn, N. Y., to Concrete Steel Co., New York; through Starrett Bros. & Ekin Inc., New York.

150 tons, building for Commonwealth avenue school, Los Angeles, to Concrete Engineering Co., Los Angeles.

140 tons, eight buildings for Pinewood avenue school, Los Angeles, to Consolidated Steel Corp., Los Angeles.

121 tons, state bridge, Lynnfield, Mass., to Concrete Steel Co., New York; through Alfred H. Lewis, Andover Mass.

120 tons, bridge over Central Vermont tracks, Monson, Mass., to Northern Steel Co., Boston; through B. A. Gardetta, Ashley Falls, Mont.

100 tons, Memorial hospital, Alton, Ill., to Dickie Construction Co., Alton, Ill.

100 tons, Hillside school, Los Angeles, to Concrete Engineering Co., Los Angeles.

100 tons, gymnasium, manual arts high school, Los Angeles, to Consolidated Steel Corp., Los Angeles.

Reinforcing Steel Pending

2500 tons, furniture building, San Francisco; general contract to Cahill Bros.

1205 tons, Conchas dam, Tucumcari, N. Mex., Griffith Co. and Bent Bros., Los Angeles, low at $4,583,876.

850 tons, Belleville turnpike grade crossing elimination; bids Oct. 5, Trenton, N. J.

700 to 1000 tons, substructure, pier No. 19, San Francisco; bids Sept. 24.

454 tons, bureau of reclamation, two parcels, Odair, Wash.; bids opened.

408 tons, viaduct, Provo, Utah; bids opened.

400 tons, buildings for Lincoln Park district high school, Los Angeles; bids Oct. 7.

284 tons, highway work, Washington county, Idaho; bids Sept. 22.

270 tons, New Jersey state paving, route 25, section 26; Tidewater Stone & Supply Co., low bidder.

215 tons, bridge, South Amboy, N. J.; bids taken Sept. 28 at Trenton, N. J.

209 tons, seawall, Newport Beach, Calif.; bids Sept. 14.

170 tons, relocation of B. & O. railroad tracks, East Sparta, O.; Ferguson & Edmundson, Pittsburgh, general contractor.

160 tons, four state underpass bridges, Saugus, Mass.; bids received at Boston, Sept. 25.

120 tons, highway bridge, Millbury-Sutton, Mass.

100 tons, dormitory, Radcliffe college, Cambridge, Mass.

100 tons, two bridges, Barbers crossing, Worcester, Mass.; bids Sept. 25.

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DEEP DRAWN SHELLS AND SHAPES

Pig Iron

Pig Iron Prices, Page 70

Pittsburgh—Pig iron shipments during September show every indication of exceeding the August total. McConway & Torley Co., Pittsburgh, is low at $1095 for steel valve repair parts for the Monongahela river locks. Youngstown Foundry & Machine Co., Youngstown, O., is low at $5398.60 for furnishing corrosion resisting cast iron for valve frames on the Monongahela river locks, Prices are firm.

Cleveland—Contracting for fourth quarter has appeared in substantial volume, far exceeding that in the similar period before the third quarter. Some attribute this to the belief that pig iron prices will soon advance in view of the continued increase in scrap prices. Requirements of farm equipment foundries have declined lately but not to such an extent as in other localities, particularly Chicago. While most auto foundries will remain out of the market until around Oct. 1, demand from railroad castings and heating household appliance foundries continues at the brisk rate set through July.

Chicago—New pig iron business continues active and fourth quarter deliveries are expected to be substantially heavier than those of the current period. While shipments so far this month show only a small gain compared with August, heavier releases are in prospect for late September and October. Automotive, farm implement and tractor foundries are increasing schedules gradually and next month will see a further gain in pig iron consumption. Prices are firm.

Boston—Foundries are again resuming a steady melt, and consequently consumed more pig iron during the first half of September than during the corresponding period in August. There appears to be an increasing tendency on the part of foundries to take shipments on larger quantities of iron than was the case several weeks ago. Sales of basic are particularly heavy. Prices remained unchanged.

New York—Pig iron demand is expanding with large orders more numerous. Recent sales include 3000 tons of basic and 1500 tons of foundry, the latter the largest reported foundry sale since a large consumer two weeks ago closed on 3000 tons for its eastern plants. A northern New Jersey buyer is reported to have closed on a fair-sized tonnage involving three grades of foundry. Royal Dutch iron has been advanced $1 per ton on all grades, effective Sept. 18, due to higher iron prices abroad and the strong foreign ore market.

Philadelphia—A steady expanding volume of pig iron business is noted, with carlot orders, is the experience of some sellers, now becoming an exception rather than the rule. Buyers are anticipating requirements further ahead, and are stepping up estimates as well. Good demand is noted for malleable iron. Malleable foundries are operating at the best rates since 1929, and one malleable foundry in this district, down for several years, is expected to resume operations shortly.

Buffalo — Reports are current that two additional blast furnaces are to be added soon to the ten already in production. These stacks are those of the Wickwire Spencer Steel Co. and a fifth unit at the Lackawanna plant of the Bethlehem Steel Co. Steelworks are adding steadily to their use of pig iron in open hearths, and merchants report steady sales and look for an excellent fourth quarter.

Youngstown, O.—Pig iron needs of both gray iron and malleable foundries are becoming more manifest with scattering lots of bessemer and basic grades also in demand occasionally, in contrast to dullness prevalent for the past four or five years. Quotations are firm.

Cincinnati — Opening of books for fourth quarter has failed to develop any rush to cover pig iron requirements, but there is a steady flow of orders. Purchasing has been keyed to conservative estimates despite a sentiment that demand will exceed by a wide margin third quarter tonnage, based partly on seasonal influences and on rise in scrap prices. Shipments are close to August levels.

St. Louis — Shipments of pig iron since the first of this month have been on a large scale, and indications point to a September total substantially greater than in July, and the highest for the month since 1929. New buying for fourth quarter is also in substantial volume. Purchasing has been stimulated by heavy prospective fall requirements and also to a large extent by the soaring scrap market. Prices are firm.

Birmingham, Ala.—Steady production and fairly active shipment of pig iron bespeak a firm market. A few additional sales for delivery during the fourth quarter have been booked. Ten blast furnaces are producing. Two furnaces are being relined and two others are being overhauled.

Toronto, Ont.—New pig iron business is generally confined to small quantity lots for spot delivery.

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Sales have moved up to around 700 tons per week. It is expected that a few of the larger consumers will place contracts soon for last quarter delivery. Production has been curtailed, the decline being chiefly in basic. Prices are firm.

Scrap

Scrap Prices, Page 71

Pittsburgh—Jones & Laughlin Steel Corp. has sold a scrap accumulation of miscellaneous grades, chiefly crop ends and No. 1 heavy melting steel, for water delivery to two district steelworks, one of which is in the Wheeling district. The price obtained on heavy melting steel is reliably reported close to $18.50. This accumulation has been held for a number of years and the aggregate sales are about 20,000 tons.

No. 1 heavy melting steel at Pittsburgh showed a net advance of $1 a ton last week over the week before. Purchases by consuming mills at $18 and then at $18.50 definitely affirmed the present quotation of $18 to $18.50. That the present market has some nominal characteristics, however, is shown in the purchase of a Wheeling district mill last week at $19, delivered, for a special lot of hydraulic compressed sheet scrap. Machine shop turnings are now quoted $12.75 to $13.25; No. 2 steel, forge flashings and bundled sheets, $16 to $16.50; couplers, knuckles, springs and other items have moved up sympathetically.

Cleveland — The inflow of scrap into this district is enabling more shipments to be made. Some good No. 1 and No. 2 heavy steel is coming out, and also a larger volume of country mixed and busheling. Some of this latter material is moving down the lakes in chartered vessels which seem likely to continue in this branch of trade well through the autumn. Valley consumers are beginning now to obtain some of this upper-lake material.

Chicago—While buying is restricted, prices bid by brokers and dealers indicate a stronger market. Sellers are paying a minimum of $16.25 in covering orders for No. 1 heavy melting steel, while previously some material was being picked up for $16. Last mill sales were at $16.25, but the trade looks for higher levels on subsequent buying. Railroad offerings the past week were small.

Philadelphia—A number of grades of scrap have been advanced, with No. 1 steel now $15.50 to $16, delivered consuming point. This increase is predicated largely on relatively small consuming sale at $15.50 with sellers refusing to take more at that figure, and on offerings by certain leading dealers to pay $15.50 where quantities can be obtained in 200 and 300-ton lots or over. On single car lots dealers are still endeavoring to pick up tonnage at $15.

No. 2 steel has been advanced 50 cents to $14 to $14.50, delivered consuming point, and several other grades have been advanced 50 cents to $1. The latter include rerolling rails, iron axles, steel axles, compressed sheets both new and old, couplers and knuckles, steel shafting, machine turnings, steel wheels and railroad wrought.

New York — Schiavone-Bonomo Corp., New York, is high bidder at $116,250 to scrap nine government ships at Philadelphia and on the west coast. About 10,000 tons of scrap is expected to result. The award may be announced next week.

Buffalo — Dealers who claim $15 to $16 is the proper range for No. 1 heavy melting steel admit they have no sales or open bids on which to base this viewpoint. However, claim is made that dealers will pay $14 for No. 2 heavy melting steel and proportionate prices for other materials.

Detroit — Price advances of as much as $1 a ton on important classifications of open-hearth scrap have now placed the market on new high ground, with No. 1 heavy melting steel quoted $14.50 to $15, up $1 a ton; hydraulic compressed sheet scrap, $14.50 to $15; No. 2 steel, $13.50 to $14; machine turnings, $9 to $9.50; and cast iron borings, $9 to $9.50. Automotive scrap lists are appearing in better volume, but anxiety of consuming mills, both locally and in outside districts, for remelting material continues to force the markets higher.

Cincinnati — With only miscellaneous consumer sales, iron and steel scrap is being keyed to nearby territories and steady shipments, on a longer haul, are being found profitable. Dealer strife for material is adding strength and, although unchanged, prices tend upward.

St. Louis—The market for iron and steel scrap continues to exhibit great strength and additional price advances have been made. Actual sales have not been heavy, due to unwillingness of brokers and dealers to accept new business because of scarcity.

Many mills and foundries are in need of scrap, and have been endeavoring to fill their requirements but find supplies small or prices too high.

Birmingham, Ala.—Scrap iron and steel market has steadied during the past few days and heavy melting

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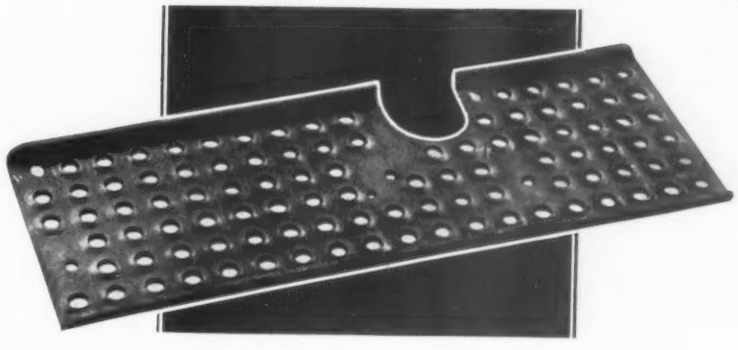

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steel holds at $11 to $12.50. Orders on local books are not numerous.

Seattle — Japan is buying sparingly, prices on this side being too high to meet Oriental ideas. Increased ocean freights are handicapping exporting. However, the market is firm and strong and prices unchanged. Dealers are purchasing all attractive tonnages. Local mills continue buying in considerable volume.

Toronto, Ont.—Trading in iron and steel scrap has improved but no large sales have been made recently. Consumers are interested in spot needs and local dealers are shipping steel grades in fair tonnage to mills in the Hamilton district. Heavy melting steel and a few other steel grades have steady call, on old contract account, both from Montreal and Toronto yards. Prices are firm and unchanged.

Warehouse

Warehouse Prices, Page 72

Pittsburgh—Steel jobbers have found September's bookings to be at a satisfactory level in comparison with first half of August. More country shipments are prevalent and with the usual fall impetus, improvement may be expected over the next six weeks. Prices are unchanged.

Cleveland — Requirements for warehouse products continue to show the extended delivery situation. Little change is reported in the daily average of sales. Specifications have been well diversified; however, bars, sheets, strip and small shapes are the most active. In view of the mild drop in specification around the first of the month, many warehouse concerns have had opportunity to replenish their stocks.

Chicago — Warehouses have reduced nail prices 15 to 20 cents a keg and have eliminated the intermediate differential classification on lots of 15 to 49 kegs. On city delivery of 15 kegs and over, the market now is 15 cents less than on base lots of 1 to 14 kegs. Price changes on other commodities are expected to be made next quarter. Business shows a slight improvement compared with a month ago.

Boston—Demand for out-of-stock items continues active, although volume of business during the first half of September has shown a slight recession from August. Prices are steady.

Philadelphia—Jobbers anticipate a better volume of business this month than in August. Price revisions in sheets and bars are expected Oct. 1, as a result of recent mill advances.

Detroit — Demand for warehouse steel products locally still holds at a high pace, generated largely by demand for new automobile plant conveyer systems, ovens, and from tool and die shops. The price structure is without change.

Cincinnati — Jobbers' price schedules for next quarter are awaited, with possibility these will reflect mill advances. Tonnage for industrial users rose enough since the holiday to counteract dullness in building materials, although a rush to complete pending projects before unfavorable weather is expected soon.

St. Louis — Warehouse volume continues to run well ahead of August. Repair materials predominate in sales, though the demand continues exceptionally well diversified. Purchasing by railroads continues in substantial volume. Prices are unchanged. Supplies for southern oil mills, gins and lumber mills are moving in seasonably heavy volume.

Seattle — Month's turnover to date is well in advance of August. Demand is well diversified and continues strong. Seasonal sheet metal jobs and activity in ship repairs account for much of the volume. Prices are firm.

Steel in Europe

Foreign Steel Prices, Page 72

London — (*By Cable*) — Production and foreign trade in iron and steel in Great Britain fell off during August, compared with July. Pig iron output was 635,800 tons in August, a daily rate of 20,509 tons, compared with 661,100 tons in July, a daily average of 21,326 tons. Active stacks at the close of August numbered 109, with 110 at the end of July. Steel ingot production in August was 872,700 tons, a daily average of 33,565 tons, compared with 974,000 tons in July, a daily average of 36,077 tons.

Exports of iron and steel in August totaled 163,959 tons, compared with 216,129 tons in July, a decrease of 52,270 tons. Imports of iron and steel in August were 141,799 tons, compared with 170,309 tons in July, a decrease of 28,510 tons.

Autumn demand for steel and iron is increasing in all districts with consumers pressing for delivery, especially of structurals. Hematite pig iron producers are prepared to book at current prices until February. Output of semifinished steel is being fully absorbed. There is some expansion in exports of heavy steel.

The Continent reports widespread demand for most products with domestic requirements expanding.

Nonferrous Metals

Nonferrous Metal Prices, Page 70

New York — Nonferrous metal prices were firm to strong last week with current levels supported by continued active consumption and prospects of heavy demand over the balance of the year.

Copper—Supplies available to consumers at 9.75c, Connecticut, were tight due to limited sales policies of some sellers. The strong price tone reflected the rise in foreign prices

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well above domestic parity, favorable August statistics showing a reduction in world stocks, and the scarcity of scrap to supply custom smelters. The tense situation eased by the weekend with the immediate outlook for a firm market at 9.75c, Connecticut.

Lead—Inquiry was active with consumers requesting an advance in shipments from the originally specified dates. The limiting of sales by St. Joseph Lead Co. further buoyed sentiment here but prices held unchanged at 4.45c, East St. Louis.

Zinc—Shipments to consumers held up well and in view of the well sustained apparent consumption rates sellers were content to await further reductions in order backlogs. Prime western held at 4.85c, East St. Louis.

Tin—Steady demand in large proportions from consumers was lacking but prices advanced to around 46.00c for Straits spot. On the whole, prices were low here compared with those in Singapore and London. The trade was cautious in their dealings awaiting the outcome of the International Tin committee on Sept. 23.

Antimony—American prices advanced ⅛-cent Tuesday but declined a like amount on Friday with spot 11.50c and futures 11.25c. Chinese spot was nominally unchanged at 12.50c. Moderate business, mostly small lots, was done.

Metallurgical Coke

Coke Prices, Page 69

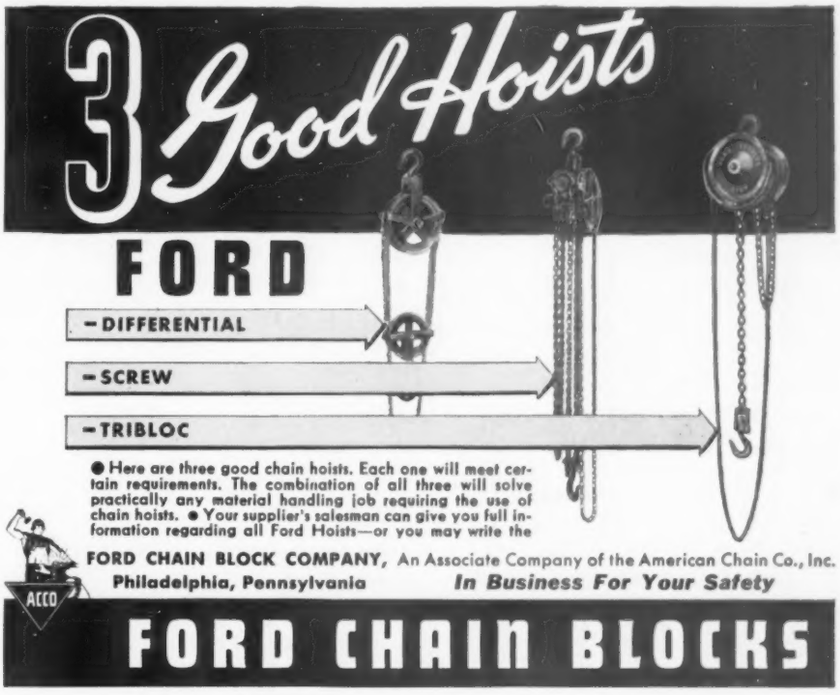
With the more insistent demands of blast furnaces for by-product coke, many by-product coke oven operators in the Pittsburgh district are withdrawing supplies from the domestic market. Owing to a shortage of coal in some quarters, there have been instances where integrated by-product oven operators have been forced to go on the outside for coking coal requirements.

A Pittsburgh district blast furnace now preparing to go in blast has bought 72,000 tons of standard beehive furnace coke for shipment over the next six months at a reputed price of $3.80 per ton f.o.b. Connellsville, Pa., ovens. The tonnage was divided between two producers. Shenango Furnace Company also has bought its fourth quarter coke requirements, turning to the use of beehive from by-product. Based on present sales standard furnace coke has advanced 25 cents a ton to $4 to $4.25.

Equipment

Chicago—Activity in most machinery and equipment markets is maintaining or bettering the brisk rate of previous months. Machine tool sales for some interests are heavier than during August or July, and with inquiries well maintained, a good fourth quarter is in prospect. Deliveries still constitute a problem for both buyers and sellers, and this factor is causing users to close promptly on inquiries. A few lists are pending for farm implement and tractor manufacturers as this industry enters a more active production period. A list for Allis-Chalmers Mfg. Co. at Springfield, Ill., remains open, while Deere & Co. has yet to close on a number of items for East Moline, Ill. Purchases by railroad shops generally are limited to a few items at a time.

Seattle—Alaska is buying in good volume in anticipation of the season's end. Logging and lumber plant replacements are creating some demand while highway projects call for machinery. Demand for pumping units is outstanding. The Puget Sound navy yard has opened bids for 168 metal cutting saws, 112 band and 48 circular saws, tension wire, scales and miscellaneous items.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Ohio

CENTERVILLE, O.—Village plans constructing waterworks system with WPA aid to cost $33,000, and include pump house and deep well vertical pumps. Voters will pass on $7000 bond issue as village's share of cost at special election soon.

CLEVELAND—City administration is working on plans for expansion of municipal light plant, city's share of cost to be $2,200,000, remainder to come from PWA. An increased capacity of between 15,000 and 25,000 kilowatts is desired. Frank O. Wallene is utilities director, City hall.

CLEVES, O. — Ohio Gravel Co., F. W. Canwell president, will repair plant damaged by fire.

CINCINNATI—Clopay Corp., York street, plans to install motors and controls, conveyors and other equipment in new addition to paper products manufacturing plant at a cost close to $100,000. Carl J. Kiefer Inc., Schmidt building, is engineer.

CIRCLEVILLE, O.—City plans construction of sewage disposal plant to cost $75,000, and a bond issue will be submitted to voters at the November election. John C. Goeller is president of council.

COLUMBUS — Board of public works, City hall, will receive bids until Sept. 29 for a battery of nine motor-driven centrifugal pumping units and auxiliary equipment, including control apparatus, for municipal sewage treatment works.

EAST PALESTINE, O. — City legislative committee has been empowered to draw up resolution authorizing service director H. F. Lemley to purchase a pump to feed new boiler recently installed in boiler plant.

FLUSHING, O.—Village considering construction of waterworks plant and sewage system. A bond issue will probably be submitted to voters at November election. Engineer is William Herbert, St. Clairsville, O.

LIBERTY CENTER, O.—Village plans construction of waterworks and distribution system to cost $53,000, with PWA aid. A $15,000 bond issue for village's share of cost was approved at special election Sept. 1. Bryan Jennings is clerk of board of public affairs, Champe, Finkbeiner & Associates, 1025 Nicholas building, Toledo, O., are engineers.

MANSFIELD, O.—City plans erection of elevated steel water tank and laying of 16-inch main on Lexington avenue at total cost of $67,000, city to furnish $35,000, rest of cost to come from PWA. Plans will be completed about Nov. 1.

MT. VICTORY, O.—Village received no bids asked for Sept. 8 for installation of water softening plant, but bids will be asked again late in September. Cost is estimated at $8000. Carl Simon, Van Wert, O., is engineer.

NEWARK, O. — Furnas Ice Cream Co will take bids soon for new dairy plant construction. H E. Eiselt, 297 South High street, Columbus, O., is architect.

PANDORA, O.—Village plans erection of waterworks plant estimated to cost $50,000, PWA to supply $30,000, mortgage revenue bonds the rest. Carl Simon, Van Wert, O., is engineer, J. Kempf is mayor.

PORT CLINTON, O. — City plans construction of municipal electric power plant. Burns & McDonnell Engineering Co., 107 West Linwood boulevard, Kansas City, Mo., consulting engineer.

SOUTH CHARLESTON, O.—Village plans construction of municipal power plant to cost $80,000 and bond issue will be submitted to voters at November election. C. D. Juvenal is mayor.

WADSWORTH, O.—City plans installation of $30,000 water softener at waterworks plant, and voters will pass on bond issue of that amount at November election. Carl Collier is service director, City hall. Barstow & Lefebre Inc., engineers, 31 North Summit street, Akron, O.

ZANESVILLE, O.—Zanesville Mould Co. plans construction of one-story, 75 x 100-foot plant addition to cost $40,000.

Connecticut

FARMINGTON, CONN.—Borough will construct complete new sewage disposal plant estimated to cost $105,000, to include two new pumping stations. A grant has been approved by PWA of $47,250.

Massachusetts

LAWRENCE, MASS.—City will construct water purification plant including pumping station and filter building at cost of $550,000, with PWA grant of $247,500.

SALEM, MASS. — H. P. Hood & Sons Inc., 500 Rutherford avenue, Charlestown, Mass., plans building a two-story, 60 x 90-foot plant costing $65,000.

WEBSTER, MASS. — Packard Mills Inc., Peryvale road, will let contracts soon for construction of a mill extension to cost $40,000. Charles T. Main Inc., 201 Devonshire street, Boston, architect.

New York

CORNWALL, N. Y.—Town will construct sewer system and sewage treatment plant costing $200,615, with PWA granting $90,276.

GRAND ISLAND, N. Y.—Town will construct complete water supply system costing $138,181 and including pumping and filtration plant and 200,000-gallon steel elevated tank on 100-foot tower. PWA has granted $62,181 for this project. Grand Island will also erect a sewage treatment plant costing $40,000, for which PWA has given $18,000.

HOLLAND, N. Y.—Town will construct sewer system and disposal plant costing $50,880, with PWA granting $22,896.

NEW YORK — Sheffield Farms Co. Inc., 524 West Fifty-seventh street, plans installing motors and controls, regulators, conveyors and other equipment in new milk pasteurizing plant at 866-30 Eleventh avenue. Cost will be about $900,000.

NORFOLK, N. Y.—Town will construct waterworks system and build a sewage disposal plant, at a total cost of $181,818, aided by a PWA grant of $81,818.

SARANAC LAKE, N. Y. — Voters will pass Oct. 17 on proposal to construct a municipally owned light and power plant to cost $500,000.

New Jersey

NEWARK, N. J.—Miele Iron Works Inc. has been incorporated, Raphael Miele is correspondent.

NEWARK, N. J.—Acme Steel Drum Co., Harry Katz president, has just pur-

(*Please turn to Page 90*)

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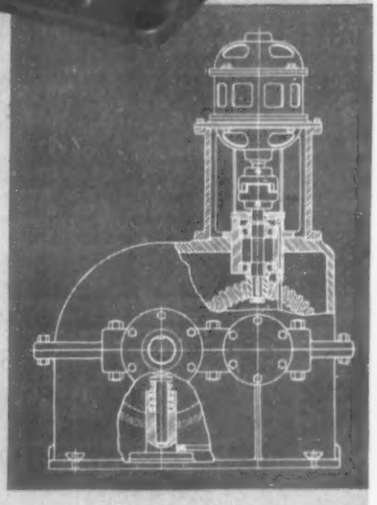

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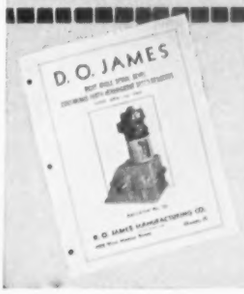

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(*Continued from Page 88*)

chased the plant of the former Newark Tube Works at 560 Perry street. The plant will be thoroughly modernized and new machinery installed.

PLAINFIELD, N. J.—The Walker-Turner Co. Inc. has purchased the plant of the Rivoli Silk Hosiery Co. at 768 North avenue as an annex to its existing plant for manufacturing small tools, tool chests and household novelties.

ROCKY HILL, N. J.—Borough has obtained PWA allotment of $56,363 for improvements to waterworks.

SUMMIT, N. J.—Ciba Pharmaceutical Products Co. is starting construction of a plant to include five buildings.

Pennsylvania

CLARKS SUMMIT, PA.—Borough will construct sewage treatment plant and sanitary sewerage system to cost $391,000, PWA having granted $175,950.

PHILADELPHIA — Commanding officer, ordnance department, Frankford arsenal, will receive bids until Sept. 24 for alternating current gasoline-operated electric generating units in lots of 15 to 45, circular 71.

WEST SALISBURY, PA. — M. Knecht & Son foundry and machine shop was destroyed by fire recently.

Michigan

ARIAN, MICH. — Michigan Producers Dairy Co., O. T. Goodwin secretary-treasurer, will erect a new building and install new equipment at a cost of $50,000.

BRECKENRIDGE, MICH.—Village planning waterworks system construction, to include two wells with turbine type pumps, 60,000-gallon elevated steel tank on 114-foot tower and pumphouse. Total cost will be $50,909, with PWA grant of $22,909.

DETROIT—Precision Spring Corp., 5900 Federal street, plans installation of motors and controls, electric hoists, conveyors and other equipment in new addition to steel spring manufacturing plant at cost of over $125,000.

DETROIT—Kelvinator Corp., 2842 West Grand boulevard, will spend $600,000 for plant expansion, to consist of construction of two new buildings with a total floor space of 304,000 square feet. George W. Mason is president; Albert Kahn, architect, New Center building.

ELSIE, MICH.—Village will build waterworks system to include elevated steel tank, pump house and deep well.

FLINT, MICH.—National Iron & Metal Co. plant, 102 Avon street, was recently damaged by fire.

GRAND RAPIDS, MICH. — W. B. Jarvis Co., 1501 Paris street, plans construction of a plant addition to cost $40,000. Pierre Lindhout, 725 Michigan Trust building, is architect.

HIGHLAND PARK, MICH.—City will improve waterworks system at an estimated cost of $186,290, PWA having furnished $83,830.

LANSING, MICH.—Olds Motor Works plans large plant expansion costing $6,500,000, to include modernization of machinery and purchase of new tools and dies.

SOUTH LYON, MICH.—City will build sewage treatment works and sewer system, to cost $58,182, PWA furnishing $26,182.

SPRING LAKE, MICH.—Village will construct sewage disposal plant and distribution system costing $41,818, of which PWA has granted $18,818.

Illinois

ANNA, ILL. — City will construct sewage treatment plant and sewerage system at an estimated cost of $249,000, PWA grant $112,000.

EDWARDSVILLE, ILL. — City plans construction of municipal light and power plant and council is considering ordinance calling for special election to approve issuance of approximately $216,000 in revenue bonds. PWA has already allocated a grant and loan of $393,000 for the project. W. C. Straube is mayor, City hall.

FLOSSMOOR, ILL. — Village plans constructing sewage pumping station and installing filters and other appurtenances at a cost of $43,636, of which PWA has granted $19,636.

GALESBURG, ILL.—Midwest Stamping & Enameling Co., S. S. Battles president, Morrison, Ill., plans construction of a factory costing $40,000 in Galesburg.

LOMBARD, ILL.—Village plans addition to waterworks system to cost $50,000, of which PWA has allotted $22,500. Included will be an elevated steel storage tank and high lift pump.

PANA, ILL.—City will improve waterworks plant and build filtration plant at total cost of $25,454, with PWA grant of $11,454.

SOUTH CHICAGO HEIGHTS, ILL.—Village will construct a sewage treatment plan consisting of pumps and several tanks, estimated to cost $60,000, $27,000 coming from PWA.

WEST CHICAGO, ILL.—City will build a trickling filter type sewage disposal plant costing $80,000, $36,000 to come from PWA grant.

Indiana

FT. WAYNE, IND.—Berghoff Brewing Corp., C. V. Miller treasurer, will take bids soon for construction of two additions, one to be five-story, 70 x 107 feet, the other one-story, 70 x 115 feet. Richard Griesser & Son, 64 West Randolph street, Chicago, architects. Total cost estimated at $100,000.

FREMONT, IND.—Village board of trustees, Rennie A. Gould president, is taking bids due 8 p.m. Sept. 28 for construction of waterworks system to include installation of turbine type well pumps, elevated steel storage tank. Engineer is Charles H. Hurd, 1039 Architects and Builders building, Indianapolis.

MITCHELL, IND.—City plans construction of sewage disposal plant with trickling filter, to cost $81,818, PWA having approved grant of $36,818.

UNION CITY, IND.—Village plans construction of sewage disposal plant and sewer system to cost $114,000, village's share to be $20,000, rest to come from WPA. Voters will pass on a bond issue at the November election. Engineer is Hoover & Montgomery, 916 Atlas building, Columbus, O.

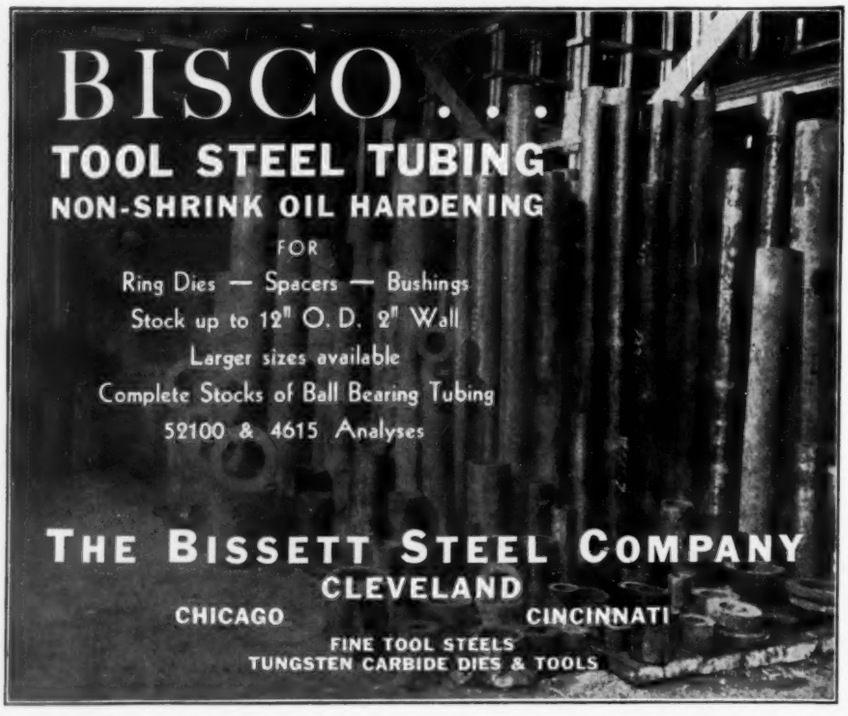
Alabama

ALEXANDER CITY, ALA. — City plans to construct $70,000 gas plant and distribution system. R. L. Kenan & Associates, Bell building, Montgomery, are engineers. T. C. Russell is mayor.

BIRMINGHAM, ALA.—W. M. Smith & Co., dealer, First avenue North between Forty-fifth and Forty-eighth streets, is in the market for a universal iron worker punch and shear.

CENTRE, ALA.—The following municipalities in Alabama have applied to PWA for loans and grants of the amounts specified, to be used for financing construction of waterworks plants: Cherokee county, $41,000; Cherokee

(*Please turn to Page 92*)



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(*Continued from Page 90*)

(city), $34,545; Eclectric, $38,000; Lafayette, $25,000; Leighton, $32,000; Midway, $30,000; Pineapple, $23,000; Rogersville, $27,272; Sheffield, $133,650; Tuscumbia, $89,100; Wilton, $30,000; Montgomery, $153,000; Port Deposit, $30,000.

MOBILE, ALA.—Armour Packing Co., Union Stock Yards, Chicago, plans rebuilding burned plant at Government and Commerce streets here. Thomas C. Scruggs is manager.

Delaware

WILMINGTON, DEL.—E. I. du Pont de Nemours & Co. is letting contracts for construction of two large plants, one an addition to a cellophane plant near Richmond, Va., the other a $2,800,000 plant for producing tetraethyl gasoline at Baton Rouge, La.

Maryland

BALTIMORE—Acme Box Co. Inc., 512 East Eden street, is considering altering and building an addition to its plant. Carl Ganter & Associates are architects, Knickerbocker building.

BALTIMORE—York street Brass & Foundry, H. F. Wolfe, manager, 125 East York street, plans razing present plant and erecting new one.

District of Columbia

WASHINGTON — Quartermaster depot will take bids until Sept. 24 for one diesel engine driven generating set with auxiliaries, circular 43.

WASHINGTON — Treasury department, procurement division, will take bids until 10 a. m. Sept. 24 for two centrifugal pumps with a capacity of not less than 40,000 gallons per hour.

WASHINGTON — Veterans administration, Arlington building, will receive bids until Sept. 25 for centrifugal pump, invitation 158-M, of turbine type, capacity of not less than 50 gallons per minute.

Kentucky

CORBIN, KY. — City commission has approved expenditure of $100,000 for improving municipal power and water plant, and the money will be raised by revenue bonds.

FULTON, KY.—City plans installing waterworks system at cost of $80,000, to include reservoir and pumping outfit. PWA aid has been sought.

GLASGOW, KY.—City plans construction of municipal power plant and will vote on issuance of $200,000 revenue bonds.

Louisiana

ABITA SPRINGS, LA. — City has voted $50,000 water and sewer bonds and $10,000 bonds for installing gas plant.

BERNICE, LA.—Town plans building waterworks system, to include elevated steel storage tank and complete distribution system, at an estimated cost of $49,090.

FRANKLINTON, LA.—Town plans waterworks system improvements and new sewer system to include pumping station and sewage disposal plant, total cost to be $38,181.

MOORINGSPORT, LA.—Town will construct new waterworks system, including elevated steel storage tank and distribution system. Cost estimated at $36,363.

Mississippi

BLUE MOUNTAIN, MISS. — Town will receive bids until Sept. 25 for construction of waterworks, including installation of pumping machinery and construction of pump house, at cost of approximately $33,870.

COLUMBUS, MISS. — City considering construction of municipal power plant and has applied to PWA for $154,000 loan and grant of $126,000. Engineer is A. H. Beard Engineering Co., 44 South Central street, St. Louis.

LIBERTY, MISS.—City has voted $19,000 bonds as its share of cost of construction of planned $30,000 waterworks plant.

GLOSTER, MISS.—Hillery Poole is in the market for syrup processing plant machinery; S. A. Neal is looking for feed mill plant machinery; and R. R. Toler will buy tin can manufacturing machinery.

PICAYUNE, MISS. — Picayune Mfg. Co. has been organized, and with aid of Chamber of Commerce will spend approximately $300,000 for new garment factory and equipment. Kranz & Braesfield, Meridian, Miss., are architects, and will award construction contract soon.

North Carolina

LENOIR, N. C.—Caldwell County Rural Electrification Co-operative, Ransom R. Corpening, Gamewell, N. C., will spend $430,000 for erecting transmission lines in Caldwell county. Spoon & Lewis, Greensboro, N. C., engineers.

WALLACE, N. C.—Z. J. Carter, dealer, is in the market for an 80 to 100-horsepower steam boiler.

WINSTON-SALEM, N. C. — R. J. Reynolds Tobacco Co. plans construction of plant to manufacture nicotine sulphate.

South Carolina

SOUTHPORT, S. C. — Town plans installing $40,000 light plant, with aid of PWA loan and grant, if possible.

SPARTANBURG, S. C. — Startex Mills plan complete new machinery installation in print cloth division of factory.

Tennessee

COLUMBIANA, TENN. — City proposes to build municipal light and power plant and distribution system, costs to be met by issuing $300,000 bonds.

GREENVILLE, TENN. — East Tennessee Light & Power Co. and Tennessee Electric Co. will spend $250,000 for new construction in next six months. R. I. Butterworth is general superintendent.

JACKSON, TENN.—Rural electrification administration has allocated $335,000 to West Tennessee Electric Membership Corp. to finance erection of 311 miles of transmission lines in Madison, Haywood, Crockett, Obion, Gibson and Chester counties.

ROGERSVILLE, TENN. — John T. Walker Lumber Co. plans rebuilding burned planing mill.

West Virginia

BEECH BOTTOM, W. VA.—West Penn Power Co. and Ohio Power Co., E. M. Plummer local superintendent, plan electric light and power plant expansion to cost $10,000,000. Present plant capacity of 180,000 kilowatts per hour will be increased to 300,000 kilowatts per hour, and two 60,000-kilowatt turbogenerators will be installed.

NITRO, W. VA. — Viscose Co., 200 Madison avenue, New York, manufacturer of viscose rayon products, will install electric power equipment in new addition to mill at Nitro. Cost estimated at $100,000.

Virginia

CLARENDON, VA. — Board of

(*Please turn to Page 94*)

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(*Concluded from Page 92*)

Arlington county commissioners, Frank C. Hanrahan county manager, is surveying possibility of constructing county-owned electric power plant. Wiley & Wilson, Lynchburg, Va., is engineer.

HARRISONBURG, VA.—Shenandoah Valley Electric Co-operatives were recently granted $125,000 for building power lines to serve 2000 farms in Rockingham, Augusta and Shenandoah counties. Additional funds will be sought for construction of a power plant.

RICHMOND, VA.—Tidewater Electric Co., subsidiary of Virginia East Coast Utilities Inc., will erect 56 miles of transmission lines to serve 356 customers in Lancaster, Northumberland, Gloucester, Mathews and Patrick counties.

Missouri

BELLE, MO.—City will construct complete waterworks system, sewerage system and sewage disposal plant, with motor-driven deep well pump to deliver water to 50,000-gallon elevated tank. Cost will be $74,545, with PWA grant of $33,545.

FLAT RIVER, MO. — City has voted $20,000 as part of cost of construction of sewage disposal plant. Russell & Axon are engineers, 4902 Delmar boulevard, St. Louis.

POPLAR BLUFF, MO. — Board of public works is planning improvement and additions to the municipal light plant, at a cost of approximately $35,000.

VANDALIA, MO.—City plans construction of $121,356 waterworks plant and distribution system. Black & Veatch, 4706 Broadway, Kansas City, Mo., are engineers.

Oklahoma

CHANDLER, OKLA.—City will receive bids Sept. 24 for construction of sewage disposal plant.

PERRY, OKLA.—City will construct new waterworks system and new reservoir at estimated cost of $210,000, aided by PWA grant of $94,500.

STRONG, OKLA.—City receives bids Sept. 29 for construction of waterworks plant.

Texas

FLOYDADA, TEX. — City council has approved preliminary report of engineers recommending construction of a municipal power and light plant at cost of $105,000. Plans are being drawn.

Wisconsin

BARRON, WIS. — Barron County Electric Co-operative association will spend $195,000 for erection of transmission lines in parts of Barron and Washburn counties, with substation.

BLOOMER, WIS.—City will construct sewage disposal plant and sewer system at estimated cost of $68,073, PWA having granted $30,633.

OOSTBURG, WIS.—Village will make improvements to waterworks system, to include construction of deep well, elevated steel storage tank and distribution system. Total cost will be $55,176, with grant of $24,829 from PWA.

MILWAUKEE — Joseph Schlitz Brewing Co., 235 West Galena avenue, will build a new power plant estimated to cost $450,000.

MILWAUKEE — Carnation Co., 715 North Van Buren street, will build a completely integrated evaporated milk plant at Galax, W. Va., to serve Atlantic seaboard trade.

MILWAUKEE — Louis Allis Co., 427 East Stewart street, has given contract to Henry Danischefsky, 3440 North Dousman street, for construction of one-story plant addition, 60 x 208 and 166 x 110 feet, for the manufacture of shipping containers and lumber storage. Total cost is estimated at $55,000.

MILWAUKEE—Wisconsin Machinery & Mfg. Co., 6048 West Beloit road, maker of pistons, dry cylinders and sleeve assemblies for internal combustion engines, is starting work on a plant addition to cost $10,000. Louis E. Vogel is president.

FOND DU LAC, WIS.—Wells Mfg. Co., maker of a complete line of ignition equipment, has transferred its plant to the former Gurney Refrigerator Co. shop at Brooke and Division streets, which has been remodeled. Ben Sadoff is president.

WISCONSIN RAPIDS, WIS.—Prentiss-Wabers Co., sheet metal makers, will build a $50,000 factory addition. Architects are Henderson & Hougen, Wisconsin Rapids.

Minnesota

FARMINGTON, MINN. — Dakota County Electric Co-operative association, A. H. Gelder manager, Farmington, plans erecting transmission lines in part of Dakota county, totaling about 185 miles, at cost of about $200,000. Federal aid is sought.

Kansas

COFFEYVILLE, KANS.—City will build addition to municipal electric system in form of complete new generating unit costing $200,000. A 5000-kilowatt turbogenerator will be needed.

Nebraska

LINCOLN, NEBR.—Sanitary district No. 1 will construct addition to present sewage disposal plant and remodel other parts, at a total estimated cost of $102,222.

SARGENT, NEBR.—City will construct sewage disposal plant costing $40,000. PWA has granted $18,000.

SCRIBNER, NEBR.—Elkhorn Valley Rural Public Power Co., P. L. Bauer secretary, plans erection of 179 miles of rural transmission lines in district, at an estimated cost of $171,909. REA funds are being sought. Henningson Engineering Co., Union State Bank building, Omaha, Nebr., engineer.

Pacific Coast

CAMARILLO, CALIF. — California State hospital will build a six-building dairy plant at a cost of $100,000. George B. McDougall is state architect, Public Works building, Sacramento, Calif.

LOS ANGELES — Twentieth Century-Fox Film Corp. will construct a one-story power house at a cost of $50,000. L. A. Barlow, 10206 Orton avenue, is engineer.

LOS ANGELES — Bendix Aviation Corp., 105 West Adams street, Chicago, is considering construction of a $10,000,000 factory on the west coast. Vincent Bendix is president.

LOS ANGELES — Gay Engineering Co., manufacturer of air-conditioning and industrial refrigeration equipment, is starting construction of a one-story, 133 x 150-foot factory at 2730 East Eleventh street.

OAKLAND, CALIF. — United Autographic Register Corp., Carter Norris manager, Nineteenth and Union streets, will build a one and a two-story factory at Thirty-fourth and Beach streets at a total cost of $150,000. Oliver M. Rousseau, 321 Kearny street, San Francisco, is engineer.

SAN FRANCISCO — Daivite Investment Co., Sixth and Clementina streets, will erect a four-story plant. Sidney A. Colton, 544 Market street, is architect.

SEATTLE — Standard Steel Fabricating & Boiler Works was recently incorporated by William J. Duthie and associates. The plant of the Standard Boiler Works at 1640 West Hanford street has been leased and the company will engage in fabrication of both structural shapes and plates.

SPOKANE — F. G. Sutherlin, commissioner of public works, asks bids Sept. 24 for construction of Ray street pumping station, 38 x 107 feet, to cost $79,000.

TOPPENISH, WASH. — Utah-Idaho Sugar Co., Salt Lake City Utah, plans installing motors and controls, regulators, transformers and accessories, electric hoists, conveyors and other equipment in new beet sugar mill near Toppenish. A power plant will also be built. Cost will be close to $750,000.

Canada

EDMONTON, ALTA. — Canadian Bedding Co. Ltd. plans remodeling plant and installing new equipment at a cost of $40,000.

VANCOUVER, B. C — Kilgard Firebrick Co. Ltd., 2521 Maple street, plans construction of plant addition for manufacturing brick, fire-clay, etc. Cost estimated at $50,000.

BROCKVILLE, ONT. — Phillips Electric Works Ltd., J. B. McCarthy vice president, will take bids soon for construction of two plant additions, each one-story, one 50 x 100 feet, the other 90 x 150 feet. Total cost $200,0000.

FORT WILLIAM, ONT. — Abitibi Paper Co. Ltd. plans reconditioning paper mill at a cost of $100,000.

HAMILTON, ONT. — Hamilton Cottons Ltd., 304 Mary street, plans installation of boilers and mechanical equipment at a cost of $100,000. H. G. Acres & Co., Ferry street, Niagara Falls, engineers.

WOODSTOCK, ONT.—Firestone Tire & Rubber Co. Ltd., Beech road, Hamilton, Ont., plans remodeling old plant and installing new machinery at a cost of $40,000.

DRUMMONDVILLE, QUE. — Electric Motors Co. Ltd. plans construction of new plant for manufacturing motors. Cost expected to be $40,000.

MONTREAL, QUE., — Sunlite Electric Co. Ltd. plans plant extensions to cost $40,000.

MONTREAL, QUE., — Barry Steel Products Co. Ltd., A. M. Barry president, 6156 Sherbrooke street, West, will make extensions to plant at a cost of $45,000.

RICHMOND, QUE. — Richmond Battery Co. Ltd., C. J. Placey manager, plans construction of new plant at a cost of $45,000.